

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

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EDITORIAL COMMENT.

APPARENTLY there is a minority in the country which would allow the Germans to murder and outrage to the very limit of their capacity, and to every barbarous infraction of the laws of humanity reply with empty words. The apostles of the other cheek to the smiter declared themselves outright in the House of Lords last week, and they have been followed by a chorus of other old women from all over the country. The Archbishop of Canterbury led off with a question, in which he asked if it were possible for the Government to make some definite statement respecting a policy of reprisals in retaliation for the outrages of the German fleet. The Christian judgment of England, he said, was that we should come out of this war, scarred and wounded and bereaved of some of our best, but with clean hands.

Reprisals and the Squeamish Minority.

Lord Curzon, in a very moderately phrased speech, outlined the reasons which had decided the War Cabinet to order the raid on Freiburg. He reviewed the treatment of British prisoners of war in Germany

and the callous torpedoing of hospital ships, and informed the House that when the German Government announced that it was the intention in future to sink these ships without warning, the War Cabinet felt that it would not be right to pass an odious threat of this description without an effort to defeat its execution. Accordingly, the German Government was warned that if the threat was carried out reprisals would at once be taken. The next step was to form a committee to decide upon what form these reprisals should take, in order that the Government might not act hastily or wrongly. Anxious that the decision to adopt reprisals should have the fullest and most authoritative sanction, the matter was referred to the Imperial War Cabinet, which agreed that there was no alternative but to carry the threat into execution. Accordingly, after consultation with our French Allies, who entirely approved of the British action, the air raid on Freiburg was authorised and carried out. As Lord Curzon pointed out, the raid itself was by no means a walk-over, since it resolved itself into a stiff aerial combat, from which three of our pilots failed to return.

Broadly speaking, said Lord Curzon, reprisals were regarded as against British instincts of humanity, and we had no intention of emulating German methods. What we had done was not an act of punishment or revenge on the enemy, it was a measure of precaution and security for our own people in the future. Lord Milner said that he was fully prepared to accept a share of the responsibility for this reprisal. No action had ever been taken with greater reluctance or after more consideration, and he hoped people would clear their minds of the idea that it was done in order to hurt innocent German women and children, because poor English wounded and English nurses were drowned. It was done with the object of preventing Germany from sinking hospital ships in the future. He was not without hope that the action taken would have the effect intended, and the only effect intended, that of forcing the Germans to reconsider their barbarous decision to pay no more respect to hospital ships.

Lord Selborne wept over the spectacle of his own beloved country descending to the German level and becoming tainted with the horrible infamy that had overtaken the German Government and the German people. What would be wrong when done by the Germans could not be right when done by the

British, and his answer to Lord Milner was that if the Germans starved British prisoners, it would be wrong for the British to starve German prisoners! By parity of reasoning, we take it that as it is wrong for a mad dog to bite Lord Selborne, it would be equally wrong for his lordship to shoot the dog to prevent it from biting other people. The right course to take would be to talk to it kindly and endeavour to bring the animal to see the error of its ways. Lord Buckmaster and Lord Loreburn agreed that the policy of reprisals was repugnant to British ideas of right, and that we ought not to adopt it. All we have to say to that is that we are thankful neither of these noble lords has any active voice in the decisions of war policy. Most certainly the War Cabinet was right in ordering the raid. The only fault about the whole policy is that the reprisals have been left too late and we have not carried out enough of them. It is no longer a question of ethics, but of hard, brutal facts. We ourselves withheld endorsement of reprisals until we in common with all who have watched with unprejudiced judgment the rapid descent of the Hun into the abyss of barbarism, arrived at the considered conclusion that the time had come to take off not only the gloves, but our coats. We are thoroughly convinced that there is only one method of getting the Hun to see reason and that is by using his own methods on his person. It is, we agree, entirely repugnant to all our ideas of playing the game, but then so is the whole war repugnant. We did not want it, but being in it we desired to conduct it in as gentlemanly a way as possible. The enemy will have none of the decencies of war, and regards their exercise as a sign of weakness, so there is nothing for it but to hit him with his own bludgeon and to sink our finer feelings for the time being. It is with concern we see that apparently the Government is paying heed to the protests of the advocates of gentle treatment for the Hun and that the Freiburg raid still stands alone, although there has been ample ground given by the enemy for a repetition on an even larger scale. We want action, and more action, if the enemy is to be cured of his *penchant* for indiscriminate murder.

The Imperial Future of Aviation.

There was some inspiring speech-making at the Connaught Rooms on Saturday last, when Gen. Smuts accepted the gift of an aeroplane, given by the London Chamber of Commerce to the Union of South Africa. After reviewing the work of our airmen on many fronts of the war and expressing himself as satisfied that we have and can retain the ascendancy of the air, Gen. Smuts went on to talk of the future of aviation after the war. Dwelling on the importance of keeping in view the use of our great fleet of aeroplanes in the war after the war, he said that the conquest of the air opened new vistas before the human race. Of the new developments, one of the greatest would be the commercial use of the aeroplane, which was being helped forward by the labours of a committee, which would work out successfully the problem of developing the use of the aeroplane in civil life. By the air, he said, the nations of the Empire might be bound together as by no other thing. Gen. Brancker, who followed, drew a picture of a line of aeroplanes running from London to Pretoria, by way of the

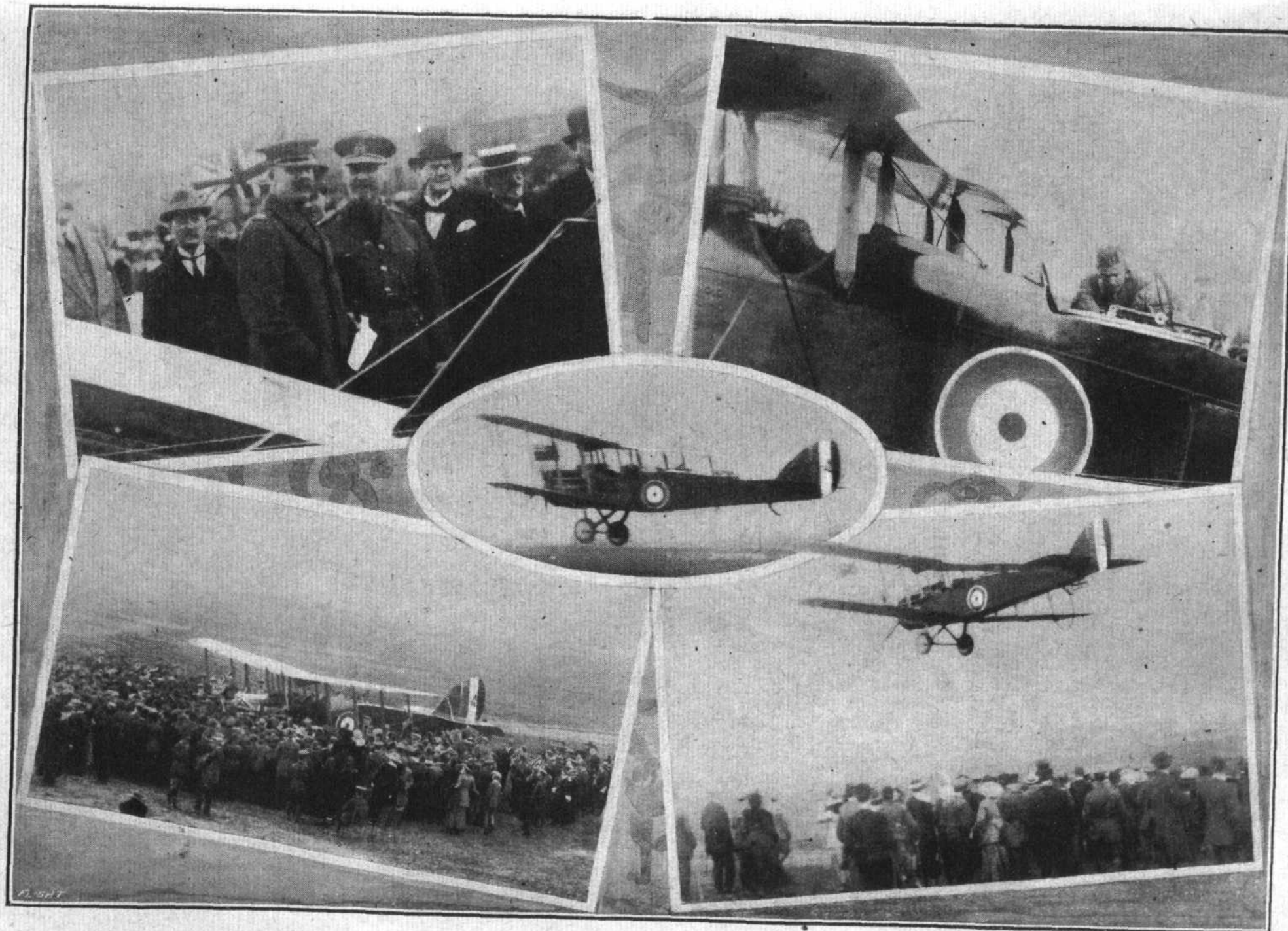
country Gen. Smuts had conquered for us. And the marvel of it all is that there is not a soul to venture to say that the picture is overdrawn. As a matter of literal fact, it is to be doubted if there is anyone in this country who has a lingering disbelief that the aeroplane now is capable of all this, and more besides. It is a great conception, this of the uttermost nations of the Empire linked closely together by constant aerial services, which will bring India and South Africa within three days, Canada a mere eight-and-forty hours away, and even far Australia a week or so distant from the Motherland. The more wonderful is the probability in that it is only a decade ago that we ourselves should have been compelled in the light of the cold knowledge of the time to pronounce such a possibility the dream of a visionary. And now that vision has become, not only a probability, but an absolute certainty. How long must elapse before the actual realisation must depend very largely on the duration of the war. Until that has been happily ended, development cannot possibly proceed along the necessary lines, but once the time is ripe we do not think we are going too far in prophesying that all these things will come to pass inside three years. It has become now not a question of the ability of the aeroplane to accomplish its part of the contract, but of the getting together of the needful capital to finance the vast aerial ventures that will follow on the consummation of peace, and of perfecting the organisation to bring them into being. When that has been done, we shall almost immediately see the distances that separate us from the Dominions overseas annihilated. India, Canada and South Africa will be brought nearer to London than was Edinburgh a hundred years ago, and even Australia will be more accessible than was Rome at the same period. It will be a marvellous triumph when it comes, as it assuredly will within the lifetime even of those of us who are approaching the sere and yellow.

Our Aerial Superiority at the Front.

On the same occasion to which we have referred above, both Gen. Smuts and Gen. Brancker spoke of the work of the aircraft on the Western front. The former said that at one time it had seemed as though our aerial supremacy was in danger. The Germans had brought forward a new type of machine in large numbers—very fast and very deadly. But “our boys” made the most gallant fight possible, even when flying inferior machines. The fighting was carried on far beyond the British lines. We had our casualties, but of all forms of war, scouting was the most dangerous, and you lost a far greater proportion of men than in any other branch. “To some extent,” he said, “we have our casualties still, but I am glad to think that our supremacy is maintained, and I hope it will be to the very end of this war, because, if there is one factor that will contribute very materially to Imperial success, it is this factor of supremacy in the air.”

Gen. Brancker told his audience that never once had the Germans prevented our airmen from doing their duty to the Army, and, after hard and bitter fighting for two months, they had again gained the upper hand over the Germans. Our aerial offensive had caused the Germans much severer losses than ours, and besides had deteriorated their *morale*.

MAY 10, 1917.



The presentation of the aeroplane "South Africa" by the London Chamber of Commerce, through the Imperial Air Fleet Committee, to the Right Hon. Lieut.-General J. C. Smuts, K.C., as representing the Union of South Africa. Left to right, from the top: General Smuts and Lord Desborough; Lord Desborough being strapped into the machine previous to his flight with Captain Hucks. Centre: Captain Hucks just getting off. Below: the christening, and Captain Hucks with Lord Desborough about to land.

FLIGHT

Success had come earlier than he had hoped for, and the output of our new aeroplanes and engines was improving, and he hoped would soon be much better if the labour troubles which were again threatening could be avoided. The success in the air might only be temporary, and efforts to improve and extend it must go on incessantly.

It is noteworthy that again Gen. Smuts referred to "aerial supremacy," a condition that Gen. Henderson has told us never has and never can exist. However, we shall not presume to split hairs over the exact meaning of the words. The main thing is that he was able to say that we are once more on top of the enemy, and that Gen. Brancker was able to back the assurance. The one disquieting note was the latter's passing reference to possible labour troubles, which might have the effect of seriously putting back the clock in the matter of our new machines. It is agreed that it is vital to the success of our arms that we should retain the mastery of the air. It is also quite clear that the enemy will leave no stone unturned to wrest it from us again, and that, as Gen. Brancker remarked, we must make continuous and unremitting efforts to keep it in our own hands. That we should tolerate labour troubles which would have the effect of jeopardising our command of the air is unthinkable. Unfortunately, we have as an object-lesson the recent troubles in the engineering trade, so that we have only too much reason to know that it is useless to appeal to the good sense and patriotism of a certain class of worker. He would sacrifice the British Army for the sake of his miserable five shillings a week "war bonus," or whatever it might be called, and it requires the strong hand to prevent him from carrying his selfishness into practice. We are all for fair dealing as between the State, the employer, and the workman, but in such a crisis as we are passing through now only one of the three parties really matters for the time being. That being so, we sincerely trust that any such troubles as are foreshadowed by Gen. Brancker will be dealt with in the only possible way. We know perfectly well that the Germans will not allow their output of new machines to be held up by any real or fancied grievances of labour, and their method of dealing with them might with advantage be studied by our own authorities. We are not in love with Prussian methods, but they are sometimes the only ones that fit the case.

The Imperial War Conference.

Among the matters that have fallen to be considered by the Imperial War Conference, which is now meeting in London, is the provision of adequate capacity for the production of war munitions. This has been made the subject of a resolution, and, we understand, this latter includes reference to the future supply of aircraft. We may take it that the matter is not dealt with in anything like close detail, since that would hardly fall within the province of such a Conference as that which is now discussing the future domestic relations of the Empire, but it does include the whole of the main issues. It is highly important that this matter of our future supply of aircraft for the purposes of war, equally with development for commercial use, should be made the subject of concrete plans. The safety, even the very existence, of the Empire must depend upon the supremacy of the air just as much as in this war it has depended—and still depends—upon

our unquestioned mastery of the seas. To that aerial supremacy, which will in the time to come be so absolutely necessary, the Dominions beyond the seas will be able to help in a tremendous degree, if only we begin after the war with a coherent plan for all to work to. We cannot, in the face of the dangers with which we shall be faced as soon as our present enemies shall have again arrived at a sufficient degree of reorganisation to once more begin to plan mischief, rely only upon the productive capacity of the homeland itself. In all the Colonies there are facilities for the building of aircraft, both aeroplanes and airships, quite equal in a smaller way to our own. These facilities, if they are properly co-ordinated now, will form a very valuable adjunct to our own industry, and it is one of the duties with which the Imperial War Conference is concerned to see that that co-ordination is brought to pass. Never again must we find ourselves on the threshold of a great war while we are in the position of having to create the whole of the organisation for carrying it on. We have had our lesson, and its precepts must remain with us to our advantage for all time.

Aerial Casualties in France.

Some idea of the bitter intensity of the struggle for the domination of the air in France is to be gained from a study of the casualties on both sides as disclosed by the *communiqués* from the several headquarters. During April the claims made by ourselves and the enemy show that, supposing they are at all correct, more than 700 machines were destroyed or otherwise put out of action. The exact number dealt with is 717. This total is made up of 369 German machines, 147 British and 201 French and Belgian aeroplanes, assuming that in the case of the last-named the enemy claims are justified. Of the 369 German machines brought down, British pilots accounted for 263 and anti-aircraft guns for six; the French claimed a total of 98 enemy machines destroyed; and the Belgians two. Whether the records are incomplete or not it is impossible to say, but the proportions do not seem to work out rightly. From all we know of the French air service it is impossible to believe that the efficiency ratio as between the French and ourselves is, roughly, as one to four, as the figures would indicate. We have destroyed, according to the statistics, 269 machines at a cost of 147. The French, on the other hand, have accounted for 98 for an expenditure of 201. It is not credible, and the explanation probably is that the French are not as careful in the issue of their figures as our own command, and there is strong reason to think that the enemy's air losses are even heavier than the statistics would lead us to believe.

Dilution of Labour.

We hear with some surprise that only now is the Government seeking powers to compel the dilution of labour in private workshops. We were certainly under the impression that the scheme of "dilution" which has worked so admirably during the war went deeper than works that are directly or indirectly under Government control. In introducing the Bill for investing the Government with the necessary powers, Mr. Kellaway said that in engineering the number of women employed has risen from 2.8 per cent. to 21.5 per cent., while their activities now range from shell-filling to important processes in battleship construction. One of the results of the successful

dilution of labour is seen in what we have recently accomplished on the Western Front. Our expenditure of shells of 6 inch calibre and upwards in the first week of the great offensive was twice what it was in the first week of the Somme battles. In the second week of the present operations it was $6\frac{1}{2}$ times as high as in the second week of last year's offensive on the Somme.

The Government will get its powers—will have them by the time these lines appear in print—and we sincerely trust that no time will be lost in putting them into active operation. The whole Press of the country has been unanimous in urging employers of labour to substitute women for men in the less skilled occupations in order that men may be released for the fighting services or for work of direct national importance. On the whole, the trade unions have played the game very well, and we were certainly under the impression that employers generally had equally risen to the occasion. It is evident from the action of the Government that this has not been so. However, the smaller employer is now to be compelled to do what he has in many instances so far declined to do as a matter of national duty—and a good thing, too.

Destroy the German Harvests?

Lord Calthorpe in a letter to the *Morning Post* advocates the destruction of the German harvests by means of incendiary bombs dropped from aeroplanes. He points out that all food crops have been taken over by the German Govern-

ment, and that the course he advocates would thus not entail making war on civilians. We quite appreciate his Lordship's motive in making the reservation, and it does him credit, but it does give us to think that the German's summing up of the British character was absolutely right when he said that: "You will always be fools and we shall never be gentlemen." Why we should trouble our heads about the lives or property of German civilians we do not know. The Huns are sinking our food ships without ruth or pity for the civilians upon whom they are trying to impose the stress of starvation. Why, therefore, should we concern ourselves about questions of simple ethics? To our way of thinking the only thing that counts in connection with Lord Calthorpe's proposal is the question of its practicability. If it be held to be practical—and we believe that it is—then let the necessary measures be taken to give effect to the policy, and let them be taken without a moment's delay.

The German crops are ready for reaping before our own—the rye crop comes on in June in parts of the country, so that there is no time to be lost if we are going to do it. But we suppose that once again the innate dislike of doing anything that could be called hitting below the belt will intervene, and we shall do nothing. In the meantime the less squeamish Hun will continue to sink our ships, murder their crews, and cause almost endless loss of valuable foodstuffs which are required to keep our people from starving. We shall see.

IN THE HANDS OF THE ENEMY.

THE *Norddeutsche Allgemeine Zeitung* of April 18th gives the following list of British airmen and machines which are declared to have fallen in the German lines on the Western Front during March:—

Fourteen Sopwiths—two-seaters.

- Nos. A 1108 and 4818: Lieut. W. Reid, Lieut. H. J. Green.
- No. 4594: Occupants dead.
- No. A 1111: P. H. Lowndes, name of the other occupant not known.
- No. A 4168: Pilot dead, observer severely wounded.
- No. 1907: Occupants taken prisoners.
- One aeroplane, number unknown, as it was entirely burnt, with its occupants.
- No. 5748: Occupants wounded and prisoners.
- One aeroplane with "le Rhone" motor, 2637: Occupants dead.
- No. 7763: Lieut. Charles Stuart Vane Tempest, Lieut. Allinson.
- One machine, the number of which was not decipherable: Lieut. Duff, Capt. Stuart.

One-seaters.

- No. A 633: Capt. (?), severely wounded.
- No. 6170: Occupant dead.
- No. 6165: Occupant dead.
- No. 6633: Name of occupant not known.

Ten Vickers—two-seaters.

- No. 1953: Capt. William S. R. Blomfield, 2nd Lieut. Victor O. Landsdale.
- No. A 5443: Occupants taken prisoners.
- One aeroplane, number not known: One occupant dead, other severely wounded.
- No. 1943: Lieut. F. E. Hills, Lieut. A. S. Ryall.
- No. A 5439: Occupants dead.
- One machine, number not recognisable: One occupant, Lieut. Knight; name of the other not known.

One-seaters.

- No. 7941: Capt. H. C. Southon.
- No. 7882: Lieut. J. M. Montembault.
- No. 3425: A.M.C.: Occupant burned.
- No. 4874: 2nd Lieut. G. J. Hasde.

Six B.E.

- No. 12205: Occupants burned.
- No. 5856: Lieut. A. G. Watts, Lieut. G. Underwood.
- No. 5179: N.C.O. Cooper, Lieut. Appleton.
- No. 6232: Lieut. Byrne, Lieut. Smith.
- No. A 27: Lieut. Wildon Anderson, Lieut. Duncan Boyd Wolley.
- No. 2560: Occupant taken prisoner.

Six F.E.—two-seaters.

- No. 4803: Occupants taken prisoners.
- No. 464: Lieut. Charles A. R. Schum, Lieut. E. C. Coops.
- Two two-seaters, numbers unknown.

One-seaters.

- No. 6397: 2nd Lieut. W. B. Hill.
- No. 6456: Lieut. Shepard.

Two Nieuport one-seaters.

- No. A 279: Lieut. Whitehead.
- No. 6615: Lieut. Hugh Welch.

Spad.

- No. A 6633: Lieut. Parves.

Hispano-Spad.

- No. 6607: Lieut. Baker.

One Martinsyde.

- No. 7508: 2nd Lieut. Webster.

One machine, two-seater, type ?, rotary motor.

- R 36,068: Capt. Lees, Bir., rank unknown.

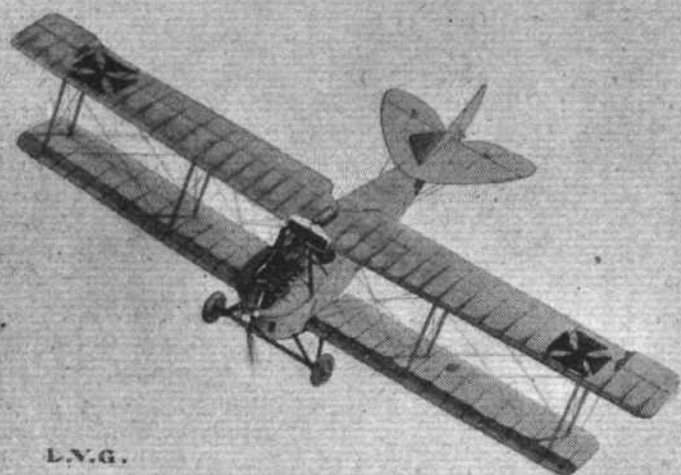
The following English machines have fallen into German hands on the east and south-east fronts:—

One Nieuport two-seater.

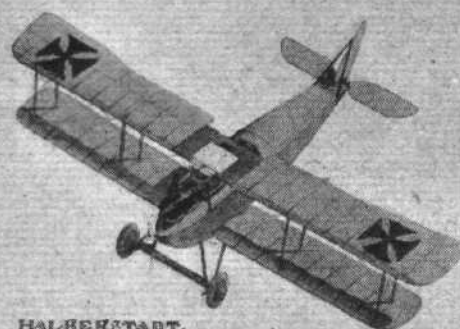
- No. 3182: Lieut. Sidney George Beare, Lieut. Edgar Peary Hyde.

One Sopwith two-seater.

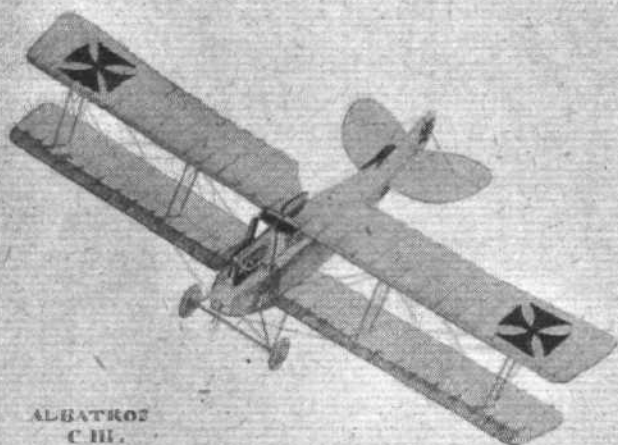
- No. 5223: Two English naval officers, both dead.



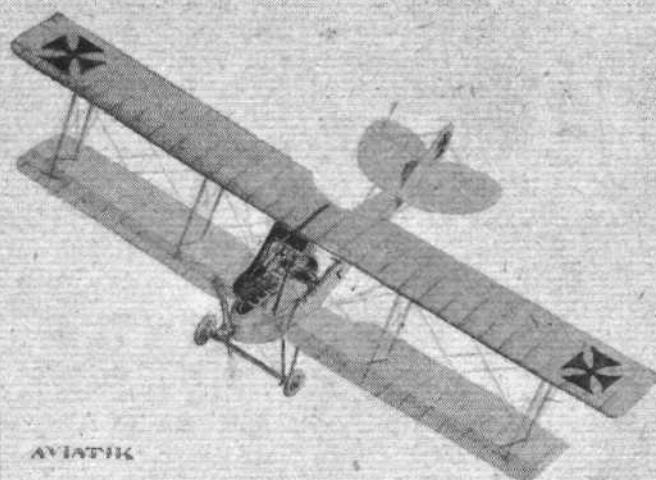
L.V.G.



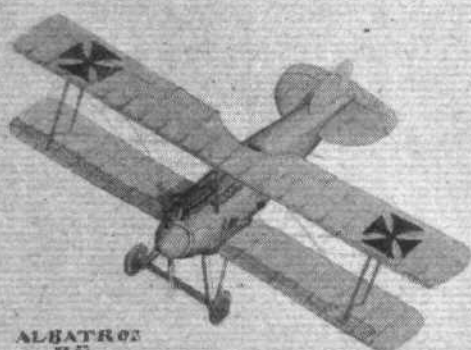
HALBERSTADT.



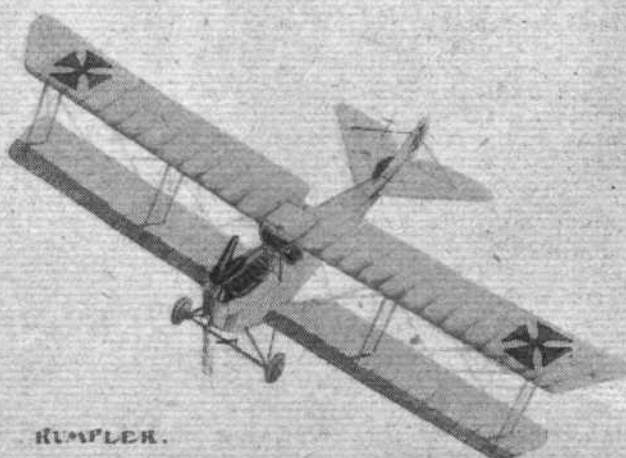
ALBATROS
C.III.



AVIATIK



ALBATROS
B.U.



RUMPLER.

The Identification of German Aeroplanes. Plate IV.

(See also page 445.)

IDENTIFICATION OF GERMAN AEROPLANES.

(COPYRIGHT.)

(Continued from page 415.)

IN our last issue we published sketches of six different German aeroplanes, all shown from the same point of view, *i.e.*, three-quarter rear from above, and all relatively to the same scale. This week the series is continued with the same machines from a different point of view. The reason for illustrating the various machines all in the same attitude is, as was pointed out last week, that by so doing comparison is facilitated. Later on, when the machines have been illustrated in what appears to us to be a sufficient number of attitudes, we may collate the different sets in groups showing each machine in its different attitudes, thereby illustrating, not so much the differences between the various machines, but all the special features of each.

A further peculiarity which may be helpful, and which is emphasised in this set as well as in that published last week, is the size and shape of the cut-out portions of the trailing edge of the wings. Thus it will be noticed that in the Halberstadt the opening in the top plane is of rectangular shape, while the lower planes have not been cut away near the body. In the Albatros Bü the trailing edge of the lower planes also runs right up to the sides of the body, but the top plane has a wide semi-circular portion cut away. Of the four larger machines the L.V.G. is the only one that does not have the trailing edges of the lower wings cut away near the body, and the opening in the top wing is quite small. The other machines have both upper and lower wings cut in varying degree, the size and shape of the cut-away portions being clearly indicated in the illustrations.

The part most clearly illustrated in the view published this week is the nose of the machines, with engine and radiator. These are, of course, seen from above, and give a good idea of the peculiarities of each machine.

It might be objected that the gunner on the ground would never see an aeroplane from the point of view

chosen this week. With this we do not quite agree, since it is possible, as the reader may convince himself by holding the page out at arm's length and slightly above his head, to see the aeroplanes from this point of view when they are banking during a dive. In any case we trust that the utility of this series of illustrations may not be confined to anti-aircraft gunners, but may be extended to pilots as well. For the guidance of those pilots who are not familiar with the gun placing on the various machines, the present set should be useful in showing the front seats of each type and where the gunner is situated, whether in the front or rear seat. The two smallest machines, the Halberstadt and the Albatros Bü, are single seaters, all the others being two-seaters. Where the gunner occupies the rear cockpit it will in many cases be found that the pilot is equipped with a synchronised gun firing forward and sighted by steering the machine itself. The same applies to the single seaters, which are, we believe, frequently equipped with two synchronised guns firing straight forward. Whatever the positions of the guns, and this may very probably be changed from time to time, the safest point from which to attack any one of the machines here illustrated is to the rear of and below the tail of the German aeroplane, since here the gunner is prevented by his own tail planes from effectively replying.

The following table gives the approximate dimensions of the various machines :—

Name of Machine.	Span.				Length	
	Top.	Bot.	Gap.	Chord.	O.A.	
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	
Albatros C. III..	39 2	37 3	5 3	6 1	26 4	
Albatros Bü. ..	28 4	26 9	5 3	5 9	24 0	
Aviatik ..	41 0	35 4	6 4	6 1	26 3	
Halberstadt ..	28 6	26 0	4 6	5 0	24 0	
L.V.G. ..	42 10	37 10	5 6	5 10	27 0	
Nimble ..	40 10	36 10	5 9	5 6	26 4	

AIR FIGHTING IN APRIL.

SEVEN hundred and seventeen aeroplanes were brought down on the Western front during April, it is pointed out in an excellent summary of the month's air fighting, prepared by the *Times* :—

"The total figures of aeroplane losses in April reveal in a way that the daily official returns do not the unprecedented intensity of the struggle for mastery in the air which was waged on the Western front during that month between Allied, and particularly British, airmen and German airmen. There has not been a month of such fighting since the war began, and the losses have never reached such a tremendous figure.

"Great as they were thought to be at the time, the largest casualties in the Air Services of the belligerents during any one month of the Battle of the Somme seem small when compared with those which are recorded for April. In July of last year, when the Allied offensive on the Somme began, there were 165 British, French, and German machines brought down. The figure was 189 in August, and in September, when the losses reached the highest mark, it rose to 322. But this figure was more than doubled last month, when, as stated, according to the official reports, the enormous number of 717 aeroplanes were brought to earth as the result of air fights or by gunfire. This is equal to about two-thirds of the losses (1,067) recorded during the six months from June to November last year.

"This total, which is compiled from the daily *communiqués* issued by British, French, and German Headquarters, is made up as follows :—German machines, 369; British, 147; French and Belgian (again, as always, with the necessary

qualification that the German claims are trustworthy), 201. Of the 369 German aeroplanes brought down, 269 fell to the British, 98 to the French, and two to the Belgians.

"British airmen accounted for 263 of the 269 German machines, anti-aircraft gunners for the other six, one of these being brought down in our lines. The official classification of the 263 was as follows :—Crashed or destroyed, 43; brought down, 55; driven down damaged (and a large percentage probably crashed), 73; driven down out of control, 84; fell in our lines, 4; forced down, 4. Two German machines were accounted for by French gunners. The other 96 were classified as follows :—Brought down, 62; driven down damaged, 4; driven down seriously damaged, 18; fell or forced to land, 12. It may be pointed out that in recording a pilot's success in an air fight, the French Ministry of War uses the expression 'brought down' in the sense that the machine was destroyed.

"The German claims are not on every occasion strictly allocated between airmen and gunners, but of the 348 Allied machines reported to have been accounted for, at least 270 were placed to the credit of pilots. Three of them belonged to the squadron which carried out the "reprisal" raid on Freiburg. Twice during the month German Main Headquarters admitted losses—on April 5th, when it was said that 'three of our machines are missing,' and on April 6th, when 'five of our machines have not returned.' On these two particular days British airmen drove down 46 German aeroplanes, a very large proportion of which were totally destroyed. This outburst of apparent frankness was not repeated during the rest of the month."

THE "TOTALLY ENCLOSED" AEROPLANE.

(Continued from page 417.)

ALTHOUGH the seaplane as a type, lends itself extremely well to closing in the occupants, it was not until 1914 that any serious attempt was made to provide the "totally enclosed" feature on a seaplane of the flying boat type. Shortly before war broke out Lieut. Porte, R.N., now a

yet the distance from the floor boards to the roof of the cabin was about 5 ft., so that by stooping slightly the occupants were able to move about in the cabin with comparative freedom. Since the machine was to have been flown over stretches of sea where meeting other machines were scarcely

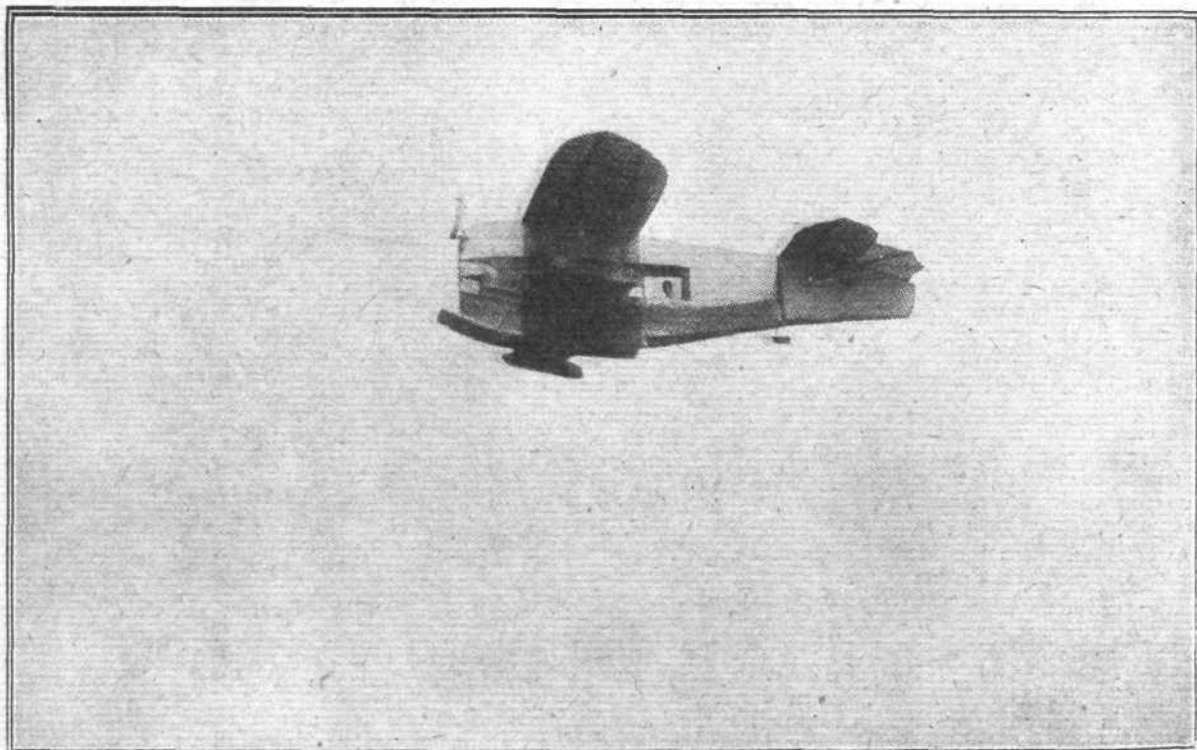


The cabin of the Curtiss flying boat "America," on which Commander J. C. Porte, R.N., was to have attempted to cross the Atlantic in the summer of 1914.

Commander in the R.N.A.S., it may be remembered, contemplated a flight across the Atlantic in the Curtiss flying boat, "America." In view of the duration of the trip it was deemed advisable to protect the pilot and passenger as much as possible against the weather, and to this end a cabin-like superstructure was added to the main hull of the machine. The latter was a biplane flying boat with two Curtiss motors placed on Vee struts between the wings. The upper plane

to be expected, the windows did not extend very far behind the pilot's seat, those curving round in front being the most important. Access to the cabin was through a hatch that could be closed once the machine was on her way, and through which, if necessary, the passenger might reach the engines to make any adjustments. Should the machine come down low enough to make signals to passing ships, the passenger would have to lean over the gunwales by the hatch, as the

The Laurence tractor flying boat, built and flown near Chicago during 1915-16.



had a span of 74 ft., and the overall length of the machine was 34 ft. Fully loaded the weight was about 5,000 lbs., and the speed somewhere in the neighbourhood of 65 m.p.h.

Owing to the great depth of the boat itself the cabin walls only projected some 18 inches above the deck, and

windows in the cabin did not provide a view in a downward direction.

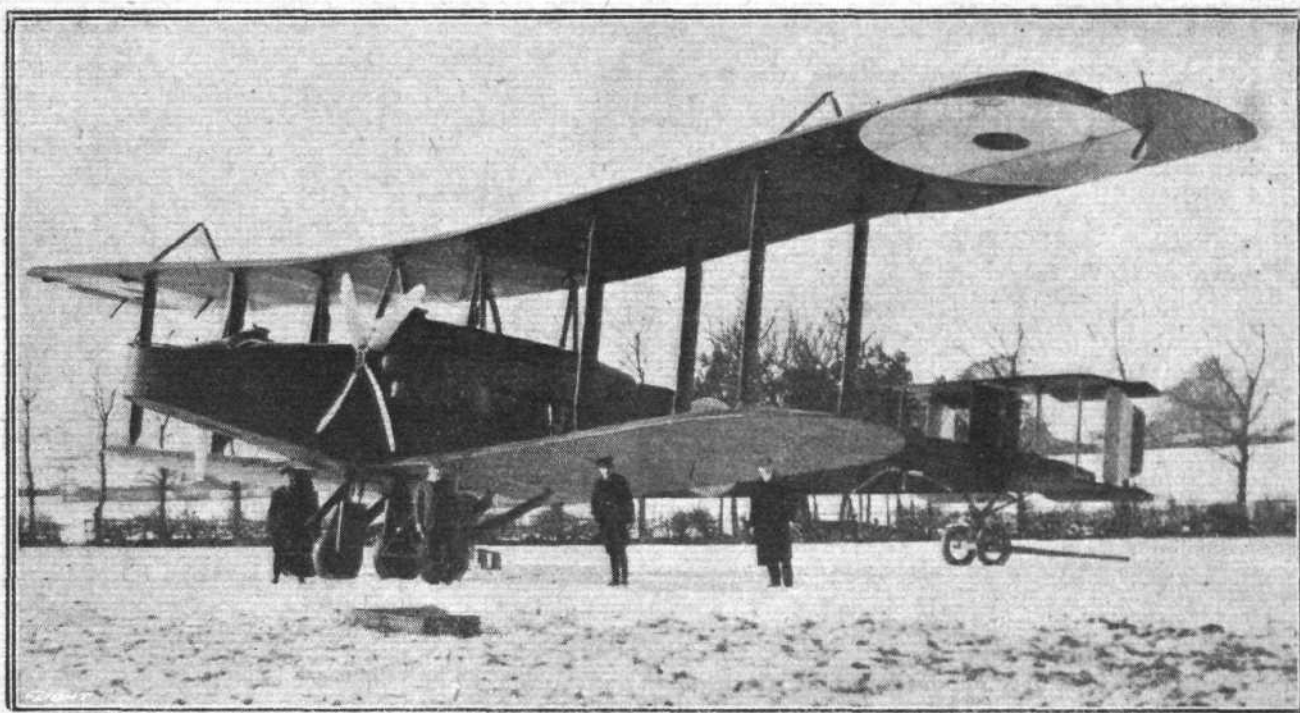
Since the war the Curtiss firm have built a great number of large flying boats, following more or less along the lines of the "America," from which some have, however, differed

very considerably as regards size. A case in point is the flying boat known as the type H-12, which was illustrated in our issue of April 26th, 1917. In general arrangement this machine differs comparatively little from the "America," and it has not, therefore, been included in our descriptions of "totally enclosed" aeroplanes to which category it naturally belongs.

During the years 1915 and 1916 experiments were carried out in America with a highly original flying boat of the enclosed type, built by the Lawrence-Lewis Aeroplane Co. of Chicago. This machine, of which no detail information is yet available, has a main float or boat built of wood in the usual way, to which is added a superstructure of stringers and fabric forming a long cabin. The pilot obtains a view of the surrounding country through windows in the side and nose of this cabin, and as the propeller is mounted high up, and the pilot is placed a considerable distance behind the lower plane, he has a fairly free view in practically all directions. The engine is placed down in the nose of the boat and drives the tractor screw through gearing. The biplane wings are remarkable on account of the fact that no system of lateral control, either warp or *aileron*s, is employed, the wings being apparently shaped to give a certain amount of inherent lateral stability. It has been announced that

transformed from a weapon of war into a commercially useful vehicle of the air, and without any very radical changes, except as regards size, the Handley-Page can be easily pictured as a trans-continental mail carrier of the future.

At the aero show held at New York early this year there was exhibited a Curtiss triplane, which aroused the greatest interest owing to the decidedly novel lines on which it was constructed. The Curtiss Autoplane as it was called was really a motor car with wings, and although there were those who, at the time of the show, were inclined to smile and regard the machine as something of a joke on the part of the Curtiss firm, or at most a machine built solely for the purpose of creating a sensation at shows and in processions, a brief consideration will suffice to show that the machine, in spite of unconventional design, is not the freak aerodynamically some critics suggest. The engine, a 100 h.p. Curtiss, is mounted in front under a bonnet, motor car fashion, and is provided with the ordinary starting handle projecting through the radiator in the nose. A four wheeled under carriage is fitted, the front wheels of which are connected up to the controls in such a manner as to allow of steering the machine on the ground at low speeds. Inside the limousine body are three seats, the pilot's in front, and two passenger seats side by side further back. The upper plane is attached to a



The successful Handley-Page biplane built in England since the outbreak of war and now doing extremely useful work.

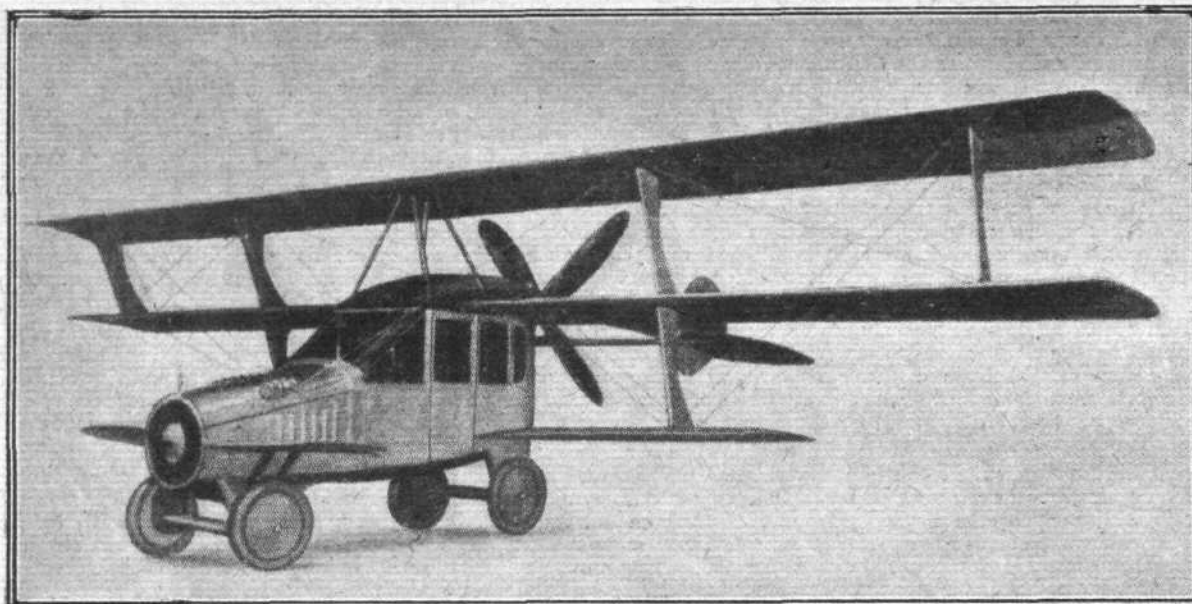
further particulars of this machine will be published shortly, and in view of the decided originality of the machine these will be awaited with interest.

Regarding what has been done in this country in the way of enclosed aeroplanes since the outbreak of war little can, of course, be said. As, however, the Germans are known to have captured one of the large Handley-Page biplanes practically intact, it may be permissible to give a few particulars of this very successful machine.

Strictly speaking the Handley-Page biplane is not a "totally enclosed" machine, as the gunner, who is placed right out in the nose, and the pilot both have their head projecting above the covering. Had it not been for the fact that this machine is being used for military purposes, there can be little doubt, however, that it would have been totally enclosed, and when machines of this type come to be employed on commercial work in peace time, the total covering in will follow as a matter of course, the general arrangement of the machine naturally lending itself to this feature. It appears probable that in this case the pilot will occupy the front seat, and windows will be provided above, below, in front and on the sides, so that the view will be practically unrestricted in all these directions. For pleasure flying in peace times it would indeed be difficult to imagine a machine offering greater possibilities in the way of comfortable accommodation of passengers, while the weight carrying capability of the machine will render possible the transportation of considerable quantities of lighter goods such as the mails, &c. With only very slight modifications the machine could be

cabane resting on the roof of the body, while the two lower planes, the bottom one of which is of shorter span than the other two, are attached to the body. The propeller is mounted approximately on a level with the centre wing, and is driven through a long shaft from the engine. In addition to the rear elevator which, with the other tail units, is mounted on two booms, there is a small front elevator projecting out from the engine bonnet, giving the impression of mud guards.

At first sight it would appear that the head resistance would be somewhat excessive, but owing to the shape of the body, a section through a plane on level with the bottom of the windows would approximate very closely to a stream line section, so that the real resistance may probably be found to be a good deal less than one would at first expect. Placed where it is, the propeller should coincide pretty well with the centre of resistance, as it must be remembered that the upper wing carries a greater load than the other two, and that, although the resistance of the body is acting fairly low down, the bottom plane is of short span and offers but little resistance. The machine would have a very low centre of gravity, certainly, but this has not proved detrimental to good flying in such machines as the Morane parasol, and the centre of side area also appears to be quite low in comparison with the centre of lift of the three wings. A constructional feature which could, we think, be improved upon is the method of mounting the tail planes, which does not impress one as being any too strong. Otherwise the machine appears to us to promise very well in many respects, and the Curtiss firm are to be congratulated on being first to produce what really seems to



The Curtiss
"Auto-
plane" ex-
hibited at
the 1917
New York
Aero Show.

be the first attempt at the comfortable enclosed small machine of the future. At the moment we have not been able to ascertain whether or not the machine has been flown, but although alterations and improvements are still to be expected, it does appear to us that this machine is a step in the

right direction. For a three seater the power does not impress one as being quite sufficient, but it should not be a matter of great difficulty to install a more powerful engine, if that should be found advisable, which we fancy will be the case.
(To be concluded.)

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Club House.

The following prices have been fixed for the present by the Committee:—

Bedroom (including Bath)	5s. each per night.
Breakfast	2s. 6d.
House Luncheon	2s. 6d.
House Dinner	3s. 6d.

Billiard Room.

The Billiard Room is now open for the use of the Members.

Flying Services Fund.

Boxes for collecting subscriptions for the Flying Services Fund are now available, and anyone wishing to have a box can obtain the same on application to the Secretary.

Official Organ of the Club.

Owing to the shortage of paper, after the current issue "FLIGHT" will only be sent to those Members intimating in writing to the Secretary that they wish to continue to receive the paper.

A reply post card has been sent to each Member. In the case of Members serving abroad sufficient time will be allowed for their replies to be received before action is taken.

Capt. Leefe Robinson, V.C.

ACCORDING to the *Frankfurter Zeitung*, Capt. Leefe Robinson was forced to descend near Douai while engaged in a fight with Non-Commissioned Officer Festner, one of the crack pilots of Baron von Richthofen's squadron. Festner has since been reported to have been shot down and killed. It is stated that Capt. Robinson was forced to descend through motor trouble, but he put up a stubborn resistance and continued to attack Festner with his machine gun from the ground until surrounded and captured by German soldiers. He is stated to be unwounded, and he has been sent to Karlsruhe.

"Aero Engines."

At the next lecture of the Aeronautical Society on Wednesday next, May 16th, Mr. L. Coatalen, A.F.Ae.S., will lecture on "Aero Engines." The meeting will be held at the Royal Society of Arts, John Street, Adelphi, and the chair will be taken at 8 p.m. by Dr. Dugald Clerk, F.R.S.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 3, Clifford Street, New Bond Street, London, W. 1.

Subscriptions.

	£	s.	d.
Total subscriptions received to May 2nd, 1917..	11,729	9	9
E. Brown	0	5	0
Staff and Workers of Gwynnes, Ltd. (Thirty-seventh contribution)	9	9	7

Total, May 8th, 1917 11,739 4 4

B. STEVENSON, Assistant Secretary.

3, Clifford Street, New Bond Street, W. 1.

Bombs on Dutch Town.

ABOUT 2.30 on Monday morning an aeroplane, the nationality of which was not discovered, dropped six bombs on the Dutch seaport of Zierikzee in Zeeland. Three persons are reported to have been killed, while 100 houses were damaged.

Raids on Zeebrugge.

MESSAGES from Amsterdam state that both on Sunday and Monday night Zeebrugge district was heavily bombed by Allied aeroplanes, and many heavy explosions were heard on the Dutch frontier. The aeroplanes were violently fired upon by the coast anti-aircraft batteries.

Zeppelin Captures Ship.

A new use of Zeppelins is reported by Dutch fishermen from Ymuiden. They report that the week before last, while fishing near the Tarbot Bank, they saw a Zeppelin stop the Norwegian barque "Royal." A prize crew put off from the Zeppelin, boarded the ship, and took it to Germany.

THE ROLL OF HONOUR.

Reported by the Admiralty:—

Killed.

Flight Sub-Lieut. R. W. Berridge, R.N.
 Flight Sub-Lieut. Holbrook L. Gaskell, R.N.
 F 671 C.P.O. (3rd Gr.) A. Chivers, R.N.A.S.
 F 3707 Ldg. Mech. D. Farquhar, R.N.A.S.
 F 21840 Air-Mech. (2nd Gr.) J. Monro, R.N.A.S.

Accidentally Killed.

Flight Sub-Lieut. R. F. Collins, R.N.

Died of Injury.

Prob. Flight Officer H. E. Grundy, R.N.
 Sub-Lieut. C. H. Osborne, R.N.V.R.

Accidentally Injured.

Flight-Lieut. L. O. Brown, R.N.

Wounded.

Flight Sub-Lieut. A. P. Haywood, R.N.
 Flight Sub-Lieut. D. M. Shields, R.N.
 F 2290 Air-Mech. (1st Gr.) A. Carder, R.N.A.S.
 F 9844 P.O.-Mech. G. Ecroyd, R.N.A.S.
 F 4373 Air-Mech. (1st Gr.) A. E. King, R.N.A.S.
 F 3813 Air-Mech. (1st Gr.) F. C. Kirby, R.N.A.S.
 F 1467 P.O.-Mech. K. M. Vaughan, R.N.A.S.

Injured.

Flight Sub-Lieut. A. F. Buck, R.N.
 Prob. Flight Officer L. E. M. Gillman, R.N.

Missing.

Flight Sub-Lieut. S. L. Bennett, R.N.
 Flight Sub-Lieut. A. E. Cuzner, R.N.
 Flight Sub-Lieut. A. H. V. Fletcher, R.N.
 Flight Sub-Lieut. T. S. S. Hood, R.N.
 Flight Sub-Lieut. J. J. Malone, R.N.
 Flight Sub-Lieut. A. S. Mather, R.N.
 Flight Sub-Lieut. E. D. Roach, R.N.
 F 15990 Aircraftsman (2nd Gr.) W. C. Danzey, R.N.A.S.
 F 3307 Ldg.-Mech. R. H. Watson, R.N.A.S.

Reported by the War Office:—

Killed.

Lieut. E. A. Barltrop, R.E. and R.F.C.
 Capt. S. Barne, M.C., Hussars, attd. R.F.C.
 2nd Lieut. G. B. Bate, Loyal N. Lincs, attd. R.F.C.
 2nd Lieut. J. S. Black, R.F.C.
 2nd Lieut. C. M. Crow, R.F.C.
 2nd Lieut. C. V. Darnell, Conn. R. and R.F.C.
 2nd Lieut. C. E. De Berigny, R.F.C.
 Capt. A. T. Greg, Cheshire, attd. R.F.C.
 Major E. O. McMurtry, Can. Inf., attd. R.F.C.
 Lieut. H. D. Mason, Can. Inf., attd. R.F.C.
 2nd Lieut. L. W. Mott, Essex, attd. R.F.C.
 2nd Lieut. F. O'Sullivan, N. Staffs. and R.F.C.
 2nd Lieut. A. Ralphs, R.F.C.
 2nd Lieut. F. H. Reynell, R.F.C.
 Lieut. P. Smith, R.E., attd. R.F.C.
 2nd Lieut. M. A. White, R.F.C.
 Lieut. C. E. Wilson, R.F.C.
 65391 2nd Air-Mech. J. H. Bolton, R.F.C.
 8983 2nd Air-Mech. F. G. Mitchinson, R.F.C.

Died of Wounds.

10473 2nd Air-Mech. J. Bramley, R.F.C.
 6337 2nd Air-Mech. W. O'Connor, R.F.C.

Previously reported Missing, believed Killed, now reported Killed.

Major M. A. Black, Dragoon Gds., attd. R.F.C.

Previously reported Missing, now reported Killed.

Capt. A. F. Baker, Duke of Cornwall's L.I., attd. R.F.C.
 2nd Lieut. A. J. F. Etches, R.F.C.
 Lieut. G. R. Rogers, Can. F.A., attd. R.F.C.
 2nd Lieut. C. L. S. Thomas, Border, attd. R.F.C.
 Lieut. J. G. Will, R.F.C.

Previously reported Wounded, now reported**Died of Wounds.**

2nd Lieut. F. J. E. Stafford, R.F.C.

Died.

37213 2nd Air-Mech. J. W. Grindley, R.F.C.

Missing, believed Drowned.

Capt. C. E. I. Charlton-Anne, R.F.C.

Wounded.

2nd Lieut. L. W. Beal, R.F.C.
 2nd Lieut. H. J. Q. Campbell, R.F.C.

2nd Lieut. E. A. Clark, R.F.C.
 2nd Lieut. R. B. Clarke, E. Surrey and R.F.C.
 2nd Lieut. R. B. Clarke, R.F.C.
 Lieut. V. H. Collins, R.F.C.
 Lieut. M. H. Coote, R.F.A., attd. R.F.C.
 2nd Lieut. A. M. N. de Levison, London and R.F.C.
 2nd Lieut. R. C. Doughty, R.F.C.
 2nd Lieut. W. M. Edwards, R.F.C.
 Capt. E. F. Elderton, R.F.C.
 2nd Lieut. C. G. Fairbairn, Yeo. and R.F.C.
 2nd Lieut. A. J. Gogarty, R.F.C.
 Lieut. H. E. Goody, R.F.C.
 2nd Lieut. J. H. Hayward, R.F.C.
 2nd Lieut. M. P. Henderson, R.F.C.
 Capt. H. G. Hutchinson, R.F.C.
 Lieut. R. V. Kann, R.F.C.
 Capt. R. M. Knowles, M.C., Norfolk, attd. R.F.C.
 2nd Lieut. E. S. W. Langton, London, attd. R.F.C.
 Capt. R. J. Lowcock, M.C., Sher. For., attd. R.F.C.
 2nd Lieut. D. R. G. MacKay, A. and S. Hrs. and R.F.C.
 2nd Lieut. N. H. Mackrow, R.F.C.
 2nd Lieut. L. J. Mars, Yeo. and R.F.C.
 2nd Lieut. J. M. Musson, R.F.C.
 2nd Lieut. F. L. Oliver, Somerset L.I., attd. R.F.C.
 Capt. H. L. H. Owen, Dorset and R.F.C.
 2nd Lieut. A. C. Perryman, Middlesex attd. R.F.C.
 Lieut. E. B. Pitblado, Can. F.A., attd. R.F.C.
 Capt. A. V. Quinnell, King's (L'pool.), attd. R.F.C.
 Lieut. W. E. Reed, R.E. and R.F.C.
 Lieut. N. L. Robertson, R.F.C.
 2nd Lieut. P. Robinson, R.F.C.
 2nd Lieut. J. A. Rossi, R.F.C.
 2nd Lieut. J. Rothwell, Manchester and R.F.C.
 2nd Lieut. E. R. Rudling, Queen's (R. W. Surrey) and R.F.C.
 Capt. J. G. Selby, R.F.A. and R.F.C.
 2nd Lieut. B. Soutten, R.F.C.
 Lieut. R. S. Stone, Can. Inf., attd. R.F.C.
 Lieut. C. G. Sturt, R.F.C.
 2nd Lieut. A. D. Taylor, R.F.C.
 2nd Lieut. E. T. Turner, A.S.C., attd. R.F.C.
 2nd Lieut. A. E. Watkinson, E. Yorks., attd. R.F.C.
 2nd Lieut. W. J. P. Watts, R.F.C.
 2nd Lieut. J. H. Westlake, R.F.C.
 2nd Lieut. N. C. Yonge, S. Wales Bors., attd. R.F.C.
 2nd Lieut. A. L. G. Young, London and R.F.C.
 2nd Lieut. E. L. Zink, R.F.C.
 44739 2nd Air-Mech. H. Dickson, R.F.C.
 8591 2nd Air-Mech. A. O. Dilley, R.F.C.
 14584 1st Air-Mech. D. McQueen, R.F.C.
 2783 1st Air-Mech. T. Sisson, R.F.C.
 19580 Actg. Corpl. A. R. Waite, R.F.C.

Previously reported Prisoner of War, now reported Wounded and Prisoner of War in German hands.

Capt. A. P. V. Daly, Con. Ran., attd. R.F.C.

Missing.

Capt. A. S. Allen, M.C., Can. Inf., attd. R.F.C.
 2nd Lieut. L. E. Allen, Yeo. and R.F.C.
 2nd Lieut. R. Applin, R.F.C.
 2nd Lieut. A. A. Baerlein, R.F.A., attd. R.F.C.
 Lieut. P. T. Bowers, R.F.C.
 Lieut. J. A. G. Brewis, Durham L.I., attd. R.F.C.
 Lieut. A. Burbury, M.C., Yorks., attd. R.F.C.
 2nd Lieut. J. A. Cairns, A. and S. Hdrs. and R.F.C.
 Lieut. W. A. Campbell, Can. Inf., attd. R.F.C.
 2nd Lieut. R. S. Capon, King's (L'pool.) and R.F.C.
 2nd Lieut. F. L. Carter, E. Surrey, attd. R.F.C.
 2nd Lieut. W. J. Clifford, R.F.C.
 2nd Lieut. F. R. Croker, Lancs. Fus. and R.F.C.
 2nd Lieut. D. E. Davies, R.F.C.
 Lieut. E. J. Dilnutt, R.F.C.
 2nd Lieut. R. W. Follett, R.F.C.
 2nd Lieut. K. R. Furniss, Yeo. and R.F.C.
 Lieut. C. L. Graves, Can. Inf., attd. R.F.C.
 2nd Lieut. C. H. Halse, R.F.C.
 Lieut. W. N. Hamilton, R.F.C.
 2nd Lieut. F. A. W. Handley, R.E., attd. R.F.C.
 Maj. H. D. Harvey-Kelly, D.S.O., R. Irish, attd. R.F.C.
 Capt. H. R. Hawkins, R.F.C.
 Lieut. G. E. Hicks, R.F.C.
 2nd Lieut. B. V. Hildyard, E. Yorks and R.F.C.
 Lieut. H. B. T. Hope, N'hampton and R.F.C.
 2nd Lieut. G. M. Hopkins, R.F.C.
 2nd Lieut. D. L. Houghton, Middlesex, attd. R.F.C.

2nd Lieut. E. D. Jennings, R.F.C.
 2nd Lieut. A. R. Johnston, R.F.C.
 2nd Lieut. M. A. Kay, R.F.C.
 2nd Lieut. F. J. Kirkham, R.F.A., attd. R.F.C.
 2nd Lieut. J. R. Lingard, Cheshire, attd. R.F.C.
 Lieut. H. B. Milling, R.F.C.
 2nd Lieut. F. A. Matthews, R. Sussex, attd. R.F.C.
 2nd Lieut. G. O. McEntee, R. Fus., attd. R.F.C.
 2nd Lieut. W. K. Mercer, Gordon Hrs. and R.F.C.
 Lieut. H. R. Nicholson, Can. Pioneers, attd. R.F.C.
 2nd Lieut. E. Percival, Norfolk, attd. R.F.C.
 Lieut. G. H. Rathbone, Can. Inf., attd. R.F.C.
 2nd Lieut. F. Roux, R.F.C.
 2nd Lieut. W. S. Spence, R. Scots and R.F.C.
 2nd Lieut. J. D. M. Stewart, R.F.C.
 Lieut. W. J. Stonier, Bedford. and R.F.C.
 2nd Lieut. H. L. Tomkies, Sher. For., attd. R.F.C.
 Lieut. T. Thomson, A. and S. Hrs. and R.F.C.
 2nd Lieut. A. M. Turnbull, R.F.C.
 2nd Lieut. E. A. Welsh, R.F.C.

2nd Lieut. S. T. Wills, Northamptonshire, attd. R.F.C.
 2nd Lieut. J. V. Wischer, R.G.A., attd. R.F.C.
 19135 Sergt. H. P. Burgess, R.F.C.
 61870 2nd Air-Mech. H. V. Gosney, R.F.C.
 61783 2nd Air-Mech. F. Ming, R.F.C.
 9329 2nd Air-Mech. A. G. Walker, R.F.C.

Previously reported Missing, now reported Prisoners of War in German hands.

Capt. W. S. R. Bloomfield, R.F.C.
 2nd Lieut. F. C. Coops, King's (L'pool.), attd. R.F.C.
 2nd Lieut. R. W. Cross, R.F.C.
 2nd Lieut. G. F. Haseler, Queen's (R. W. Surrey), attd. R.F.C.
 Capt. A. Lees, R. West Kent, attd. R.F.C.
 2nd Lieut. V. O. Lonsdale, R.F.A., attd. R.F.C.
 Lieut. R. T. B. Schreiber, Suffolk and R.F.C.
 2nd Lieut. T. Shepard, R. Warwick, attd. R.F.C.

Previously reported Missing, now reported Prisoner of War in Bulgarian hands.

2nd Lieut. A. C. Stopher, R.F.C.



ON THE WESTERN FRONT.

IN the first of his articles on the Western Front the Military Correspondent of the *Times* says:—

"In four months before Arras our aeroplanes reported 1,589 direct hits on German guns, as well as some 200 important explosions, so that the German administration, which was already hard put to it to repair its guns, to create a reserve, and to provide artillery for the new divisions, must have had an anxious time."

"I only saw two German aeroplanes cross our lines during my visit to the British front, and when some of ours came up and drove them off I thought that ours looked like thoroughbreds and the German hackneys. There were, however, plenty of German aeroplanes on the German side of the line, as well as many observation balloons. The Fokker is fairly played out on the Western front, where the Albatros one-seater and the Halberstadter represent the best single-seater fighting machines of the enemy. The former has two guns firing through the propeller and a 160 h.p. Mercédès engine. The Roland, the L.V.G., the Rumpler, and the Aviatik are the most common two-seater types. Fighting, reconnaissance, and artillery work are carried out by separate units, and a sharp distinction is drawn between these different spheres of aerial activity. The organisation of the German Air Service is fairly well known to us, and we also know to our cost that we were met by superior numbers of fast single-seater fighting machines at the opening of this year's campaign."

"We must make up our minds that whenever we relax our efforts at home a great nation like the Germans will beat us, and this is not true of aviation alone. The Germans produce some star pilots who are quite good, and I fancy that the personnel in the German observation balloons is drawn largely from the artillery, as it should be. But I should say that the general level of efficiency is higher in our service than in the German, and assuredly despite the enemy's good fast fighters, and his numerous anti-aircraft batteries and sections he has accomplished much less than our men, and our pilots retain all their offensive spirit."

"We must expect ups and downs in a novel service of this kind when so much science and industry are arrayed against us, but the unconquerable spirit of our men will prevail in the end if only the home organisation is equal to the energy at the front."

In his second article he continues:—

"With an enemy like Germany we cannot afford to slacken speed in the output of men, guns, aeroplanes, or anything else. If we do we ask for trouble, and we asked for it last winter in the Flying Corps. The enemy made a great effort to suppress our flying men who were throttling him, and produced two fast one-seater battleplanes for every one of his artillery scouts. We were in inverse proportion, and our boys in the air had an uncommonly warm time, and very heavy casualties, fighting machines and scouts alike. Did the Flying Corps retire and leave the field free to the enemy

as the enemy did when we were superior last year? To their imperishable honour they did nothing of the kind, but on the contrary multiplied their flights, took the offensive regardless of losses with the utmost hardihood, and either drove or drew back the enemy from the front, giving our artillery and photographic aeroplanes the chance of continuing their invaluable work which was vital for the success of our guns. I may get into trouble for naming anybody, but General Trenchard and his birds will be an inspiring memory to the Army when it looks back at the early months of 1917."

"Coming here one perceives the folly of criticising types of machines used. It is no more possible to say what is the best type of aeroplane than to say which is the best type of ship, for in each case it depends upon the use to which it is to be put. For fighting, scouting, photographing, bombing far or near, and for long-distance reconnaissance, different types are needed, and as we cannot always have all and everything of the best there must occasionally be men in second-grade machines. There must be pre-Dreadnoughts of the air who get into a line of battle and fall among Dreadnoughts, and there must be light scouts which are met by faster scouts. We should have but few birds in the air if we used none but the latest aeroplane of each type, and the enemy would be similarly circumstanced if he adopted the same practice. Our pilots are for the most part young fellows of 19 or 20. It is an impressionable age, and we ought not to keep on telling them that they have second-grade machines even if it is true. Neither should we trust entirely to the pilots for types, any more than we should trust Tod Sloan to choose us a yearling. So far as an amateur can judge, I think that our latest type of fighting machine is equal to the latest German, and our need is for a greater number of them—fast, one-seater, fighting machines, each with two guns. But if we can go ahead full speed we must also remember that we must have a new type constantly ready, and that any such type, perfected now, will not reach our armies under present conditions before May, 1918, at all events in appreciable quantities. It is above all things necessary to curtail the time between the final approval of a type and its output in large numbers. The wear and tear of pilots and of machines is very great. The life of an aeroplane in France is not more than two months. A pilot requires to fight for two months before he is much good, and the strain is so great that few men stand it for more than three, six, or nine months more. If in face of all the immense difficulties, of which the westerly winds have not been the least, our airmen fought their way through the early spring of 1917, and enabled the guns to register accurately 93 per cent. of the positions of German batteries on a certain day of battle, I think that this stands to their eternal credit, and I make no doubt that they will continue to succeed if we support them handsomely, and will, in the contrary event, perish gloriously rather than give the enemy the air."



A Derelict German Seaplane.

A GERMAN seaplane, of the latest type, was recently found in the North Sea, and taken by fishermen to a Kentish

port, where it was handed over to the authorities. Apparently the machine had been obliged to descend on account of engine trouble, and it is believed to have started out to bomb the Kent coast.

ANSWERS TO CORRESPONDENTS

[As a number of letters reach us signed with initials only, some of which do not give a complete address, we would point out that such communications cannot be dealt with in our columns. Full name and address, which will not be published, must always be given.—Ed.]

Notice to Correspondents in General.

Applications for commissions in the Royal Naval Air Service should be addressed to the Director of Air Services, Admiralty, S.W. The necessary form and conditions of entry can be obtained from the Secretary of the Admiralty.

Applications for commissions in the Royal Flying Corps should be sent to the Director-General of Military Aeronautics, Hotel Cecil, Strand, W.C.

Those who wish to enlist in the R.N.A.S. should apply to the nearest naval recruiting station or to the R.N.A.S. Drafting Office, Crystal Palace, S.E. Skilled mechanics are taken whatever their army classification, but unskilled men are only taken if they are classified B1, B2, or C1.

Recruiting for the R.F.C. is closed for the time being, and any enquiries should be made to the Officer Commanding, Royal Flying Corps Depot, Farnborough.

Enquiries with regard to appointments in the A.I.D. should be addressed to the Chief Inspector, Aeronautical Inspection Department, Hotel Cecil, W.C. 2.

"Pilot" (Ilford).

We do not think it would be possible to effect a transfer at the present time. Anyway, you must obtain the consent of your commanding officer.

E. L. (Chingford).

It is impossible to advise you. Your best course would be to place your case before the management of the firm you are with.

W. W. (Montreal, Canada).

The object of the variable incidence on the Nieuport scout is to provide means for adjusting longitudinal balance. Thus engines of slightly different weight may be fitted without necessitating any other alteration than that to the incidence of the lower planes. The Nieuport patent specifications cover means for altering the incidence during flight; but this is not, we believe, generally done, any adjustment required being made while the machine is on the ground. As regards the power required to bring the bottom planes back to their normal angle, *i.e.*, the angle at which the centre of pressure was situated on the tubular spar, this would not, we think, be very great. Without giving actual figures, a hypothetical example will illustrate this point. Assume that the length of each bottom plane is 10 ft. and its chord 2 ft. 6 ins. Further, assume a loading of 5 lbs./sq. ft. On a chord length of 2 ft. 6 ins. the travel of the centre of pressure would scarcely exceed 2 ins. each way. This would mean a turning couple, on each wing, of $10 \times 2.5 \times 5 \times 0.17 = 21.25$ ft. lbs. For the two wings the couple would be 42.5 ft. lbs. Assume that the lever operating the variable incidence is 2 ft. long, the pull that would have to be exerted by the pilot on this lever would then be $42.5 \div 2 = 21.25$ lbs., which is not excessive.

As regards the action of the dihedral angle, your reasoning appears to tally with ours, except that you have not taken into account that when a machine having a dihedral angle is banked until one of its wings is horizontal, the pressure on the other has a horizontal component, as well as a smaller vertical lift. This horizontal component is not balanced by a similar and opposite one on the other side, and the machine therefore tends to move towards the side of the depressed wing.

C. A. H. (Barnet).

We are not quite certain as to what is the cause of the peculiar change in the sound made by an aeroplane according to whether it is close or far away. Certainly we have often observed, as you point out, that when the machine is approaching the note is rather high. When the machine is immediately overhead the sound becomes much deeper, and gradually the note becomes higher as the machine recedes. We are inclined to think that the explanation is this: The sound of an aeroplane is made up of two separate notes, one fairly deep made by the engine, and the other considerably higher, caused by the swift movement of the various parts of the aeroplane through the air. Of these two notes, the higher will carry farther than the deeper.

When the machine is quite close, the deep sound is near enough to carry, and is, therefore, the predominant. As the distance increases, the higher note begins to carry better, and is heard over and above the deeper hum of the engine. As already stated, we are not certain whether or not this explanation is the correct one. Perhaps some reader will be good enough to give another?

J. W. (Sheffield).

"Aeroplane Design," by F. S. Barnwell, would help you. It can be obtained from "FLIGHT" Offices for 2s. 10d. post free.

W. B. (Erdington).

Pusher biplanes have looped. Your second question we are not permitted to answer until the war is over.

Air-cooled (Selby).

You cannot do better than study the Wolseley handbook on Renault engines. You can obtain it from "FLIGHT" Offices for 5s. 4d. post free.

S. G. N. C. (Wandsworth).

We have published one or two photographs of machines presented to the Government. It is impossible to give the opinion you ask for, as so much depends upon the use to which the machine is put.

A. E. T. (Birmingham).

If passed for General Service you might find difficulty in enlisting, unless you were exceptionally skilled at your trade.

J. F. A. A. (Whitley Bay).

Several of the "dope" manufacturers issue pamphlets containing hints on the application of dope, &c. The use of poisonous dopes is now prohibited.

A. W. B. F. (Farnham).

It is doubtful if you could obtain a commission even as Equipment Officer. For particulars as to enlistment, write to the R.F.C. recruiting department, The Polytechnic, Regent Street, W.

M. E. D. (Southend).

You should take every opportunity of studying the subject whether from books or by inspection of actual machines. If possible try and get a position in an aircraft works.

G. N. (Pulham).

Write to the Secretary of the Admiralty for a copy of the conditions of entry of officers in the R.N.A.S. It will give you all information.

Mechanic (High Wycombe).

1. Yes; he gets an allowance for kit. 2. Equipment Officers have to go through a special course of training. 3. The allowance is granted when the commission is secured.

W. A. F. (A.S.C., M.T., France).

There are two distinct methods of firing a machine gun "through" the propeller of an aeroplane. By the first method the gun may be fired at any desired moment irrespective of the relative position of the propeller. In order to protect the latter from damage the portions of the blades which come in line with the gun are lightly armoured and deflect the small percentage of bullets that strike the propeller. The second method consists in gearing the trigger of the machine gun to the engine or propeller shaft by means of a system of cams and levers in such a manner that when a propeller blade is in line with the gun the trigger cannot be pulled, thus preventing firing until the blade has passed the muzzle, when the trigger is released, and the firing continued. It should be understood that in both cases the gun is immovably fixed to the aeroplane, sighting being accomplished by steering the machine itself.

Lieut. F. W. (R.F.C.).

At the moment the only book available for immediate delivery is "Aeroplane Design," by F. S. Barnwell. This book may be obtained from the offices of "FLIGHT," the price being 2s. 10d., post free. Other books dealing with this subject are out of print for a few weeks.

With regard to our reply to A. C. (Waltham Abbey) in the issue of "FLIGHT" of April 10th, Mr. S. T. Swaby, of 4, Cross Flatts Row, Beeston, Leeds, writes the following: "Should your correspondent care to go into the matter (the Mersey monoplane.—Ed.), I might be able to supply details. I was the designer and partner in the machine, and should be glad to be of any assistance in my power."

AIRISMS FROM THE FOUR WINDS

CAPT. C. M. INNES is a good sport as well as Chief Constable of Lincolnshire. The other day, when informed by a police sergeant that for 10 minutes a bright light was showing from an unshaded window in a servant's bedroom at his house, his reply to the officer was, "Send in a report against me in the usual way," with the result that the Sleaford magistrates subsequently relieved him of ten shillings.

THE friends of Mr. Marcus D. Manton always knew that when the occasion arose he could "stunt" with the best of them. In his capacity as test pilot for Messrs. I. Samuel White, Ltd., he has done a great deal of cross-country flying with complete success, and lately he added to his many experiences some looping on a new machine, which is neither a monoplane, a biplane or a triplane, to the surprise of some of the privileged spectators. This is probably the first time a 'bus of this particular character has ever been looped. By the way, as Mr. Manton flies both land machines and sea-planes, would it be correct to speak of him as an amphibious aviator?

A CHEERY and characteristic letter from our old friend Louis Noel, who is still doing fine work out in the East, to one of our staff, recounts a recent adventure of his which nearly put his name in the casualty list. "I am now having a few days' rest," he says, "owing to that my Sopwith was smashed to pieces by the Bulgarian artillery. I was off for an army reconnaissance when, about 30 km. inside the lines, my motor completely broke down (a connecting rod). I was only at 12,000 feet and thought that I shall be forced to land and have a lunch with the Boche! But this idea ran through me as a shiver, and in putting all my 'savoir' in my stick I began my glide of 30 km. I crossed the Bulgarian trenches at 180 metres, followed by a heavy artillery fire, and we were received by the machine guns. Before crossing the lines I made a sharp half turn, and I think it saved our lives. The tail was riddled by bullets. I managed to get behind the first English trench, where as soon as we left the 'bus it was destroyed by the Boche guns and smashed to atoms! Thus I am on a forced leave. Happily my 'Spad' got here and I shall have it in a few days, and off for some more fun. . . . Bravo, Louis! May your luck continue till the end of the war when we shall all be glad to see you back again in England.

A WELL-KNOWN officer in the R.N.A.S. now in this country has a famous bulldog which ought to be immortalised in the history of aviation. It has flown with him on many occasions, both at home and in France, and is a popular pet at air stations. It has now acquired a remarkable affection for tins of petrol—full ones, it may be noted—and if one is lying about the sagacious beast seizes it by the handle and drags it off in triumph to the feet of its master. Fabulous offers have, it is rumoured, been made for the dog by the owners of motor cycles and cars. For so accomplished an animal a petrol licence would seem more useful than a mere dog licence. We should like to publish a photo. of the bulldog at work, neglecting Spratts for Pratts.

A COMMA is an awe-inspiring item in the world's system for "carrying-on." Many troubles have arisen by the insertion or misplacement of the little sign. As unique an instance as any so far recorded is now to hand from across the herring pond, where, by the omission of a comma, very nigh unto a calamity has been brought about in our new Ally's naval aeronautical proposals under the \$115,000,000 Naval Emergency Fund to help prosecute the war against the Huns, which has just been put through by the Senate. Its omission was just detected in time, else would the Aircraft Department have had no financial backing wherewith to supply the machines which are so much desired this side and for submarine strafing purposes. The clause in the Emergency Fund Bill, as passed, read as follows:—

"To enable the President to secure the more economical and expeditious delivery of materials, equipment and munitions and secure the more expeditious construction of ships authorised and for the purchase or construction of such additional torpedo boat destroyers, submarine chasers and such other naval small craft, including aircraft guns and ammunition for all of said vessels," &c., &c.

To Senators Poindexter and Lodge's scrutiny is due the addition, before the signing of the Bill, of the very important comma between the word "aircraft" and "guns." And so the situation has been saved. Was this another subtle attempt of the hyphenated "Hidden Hand"?

MR. HOLT THOMAS' lecture on "Commercial Aeronautics" on May 30th in the Central Hall, Westminster, before the Aeronautical Society, should bring together a record audience. It is probably one of the most intensely attractive subjects of the times, and the meeting should be the more interesting from the fact that Lord Cowdray, the Air Minister, will preside, and amongst the speakers will be both Lord Northcliffe and Lord Sydenham.

AMONGST the Fellows elected by ballot last week of the Royal Society was Dr. L. Bairstow, to whom congratulations upon the well-merited honour.

THERE is much food for reflection in the fraternal telegram just sent by the American Society of Automotive Engineers to the British Institution of Automobile Engineers, the wording of which is as follows:—

"We consider the farm tractor one of the most potential elements in solving the food problem. Our membership includes tractor engineers of all leading manufacturers, much tractor experience and information is at our command, and in extending our brotherly sympathy and co-operation in the common struggle for democracy we formally place all our data at your disposal and would be honoured to collaborate in any way you desire. Standardisation in farm tractor manufacture, as well as in airplane and motor-boat manufacture, is being pushed vigorously, and other activities are being forwarded aggressively. Command our assistance as you desire in the food increase work."

THE bracketing of the "airplane" for standardisation, at this early stage of the industry, with farm tractors and motor-boats, gives promise of very solid advances, not only during the continuation of present hostilities, but in the aftermath. Our Government Department concerned with the work for which co-operation is offered, has already intimated how best the A.S.A.E. can help forward mutual interests.

THERE seems to be a deal of surmising going on in certain Press circles how it comes about that Squadron Commander E. F. Briggs has just been promoted Wing-Commander. Why not make a little enquiry in the right direction?

NONCONFORMITY and reprisals do not appear to run together very comfortably in harness. "Surely," say the National Council of the Evangelical Free Churches, in pleading with the Prime Minister their disapproval of the recent raid on Freiburg, "our cause will stand higher with mankind by our keeping free from a policy which, while futile in itself, will only tend to foster permanent hatred on both sides." Which sounds quite all right when dealing with civilised nations; but perhaps the N.C.E.F.C. have not followed exactly the methods of these Kadaverous barbarians. The N.C.E.F.C. need not concern themselves overmuch, as to any other peoples, including savages, on this globe of ours, it would be possible to bring home a sense of shame for their misdeeds; the Huns are hopelessly beyond redemption. Annihilation is really the only effective reprisal remedy with these gentle folk.

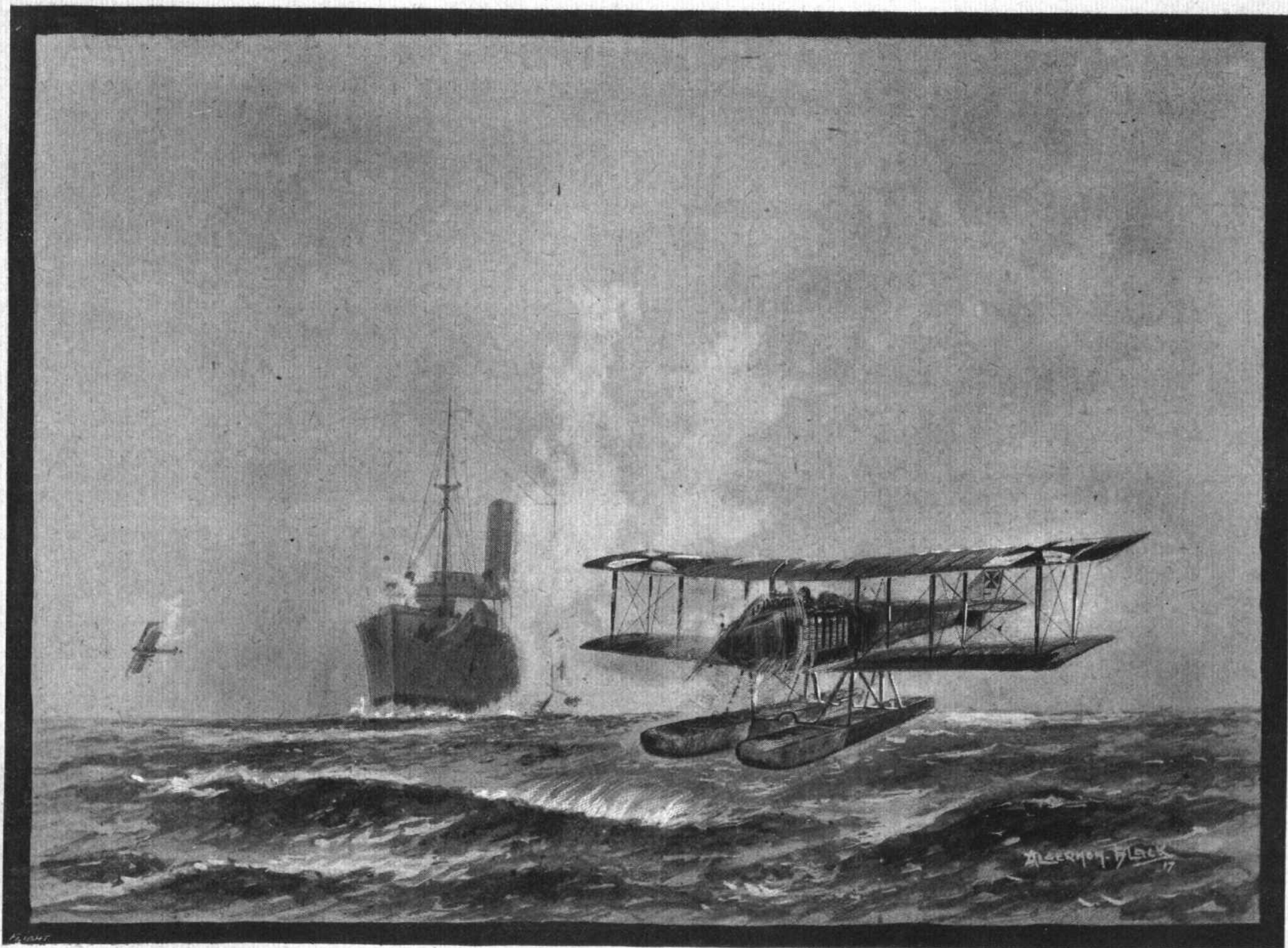
ACCORDING to the *Times*, a crucifix made of pieces of the Zeppelin brought down in the village has been placed in Potters Bar parish church.

We wonder why and how the procedure was reasoned out.

A POINT to add to the curriculum of new pilots our Flying Service authorities might beneficially consider is a strong caution to avoid attempts at "stunts" for the delectation of relatives, just to demonstrate, with possibly pardonable pride, what remarkable feats the beloved one is able to achieve. Many a "mishap" in the past has had to be recorded, as a resultant, and without authoritative caution

MAY 10, 1917.

FLIGHT



TORPEDOING FROM THE AIR.—The recent enemy seaplane torpedo attack on the East coast.

the list may in the future be indefinitely extended. We cannot afford to lose good pilots from so unnecessary a cause.

QUITE a cultured idea of the German Government, the placing of British officer prisoners at points which may receive the attention of our reprisal air-bombers. That three flying officers, probably including Flight Commander Leefe Robinson, should have been selected for this doubtful honour of "protecting" Karlsruhe, adds a further touch of Hunnishness to the violation of the ethics of honourable warfare.

TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT's" precursor and sister journal) of April, 1907. "FLIGHT" was founded in 1908.

BLÉRIOT AEROPLANE BROKEN.

At 7 o'clock on Friday morning, April 19th, M. Blériot made another trial with his aeroplane at Bagatelle, after having had a new propeller fitted measuring 1.3 metres in diameter. Unfortunately his machine came to grief at its

first attempt to fly, for after making a satisfactory spurt across the ground at a sufficient speed to lift the machine to a height of perhaps 2 metres, the apparatus suddenly crashed down on to the ground apparently as a result of some faulty manipulation of the horizontal rudder. The aeroplane was badly damaged, but M. Blériot, with the good fortune which is almost becoming proverbial among aeronauts, was uninjured.

SANTOS DUMONT ADOPTS ALUMINIUM.

M. Santos Dumont is having a new aeroplane built to replace his "No. 15," which, as we recorded in the *Automotor Journal* of April 6th, was wrecked during one of its trials at St. Cyr. The old machine was constructed of mahogany, which material, it seems, the inventor no longer approves, for we understand that his new aeroplane—which is to be of the same size as No. 15, and will be fitted with the same motor—will be mainly built of aluminium and steel tubing. It is estimated that the increased weight will not exceed about 27 lbs., and that the finished construction will offer less resistance to motion.

"X" AIRCRAFT RAIDS.

IN view of the decision of the Government not to allow details of places visited by enemy aircraft to be published, we are, as before, giving to each one an index number. Eventually, when details are available, we shall give the respective information under these index numbers, which will facilitate easy reference to each particular raid.

"X 59" Raid (May 7th).

The following communiqué was issued by Field-Marshal

Lord French, Commanding-in-Chief, Home Forces, on May 7th:—

"In the early hours of this morning [about 12.30 a.m., E.D.] a hostile aeroplane appeared over the outskirts of North-East London and dropped four bombs. One man was killed and a man and a woman injured. Slight damage was done to buildings."

AIRCRAFT AND THE ADVANCE.

WRITING to the *Daily Mail* on April 28th, Mr. W. Beach Thomas says:—

"I went up to-day to an aerodrome to watch our new fighting aeroplanes shoot out to battle and return home again after their duels. The waiting hours were spent in seeing all the apparatus of fighting in the air and in hearing tales of this man's triumph and that man's fate.

"We have never before hit the German so hard or so harassed him by day and night. A night or two ago our men broke up three trains near Douai, one after the other, with bombs dropped from a couple of hundred feet, and so terrified soldiers and other officials with the rattle of machine guns that the attackers escaped with scarcely an attempt at resistance. A day later two of our fighting planes which had sought the Germans in vain for several previous days suddenly came upon a fleet of 14. Our pair hesitated as little as the destroyers 'Broke' and 'Swift,' though they were struck with amazement at the spectacle, for the Germans had painted their machines every sort of colour. Apparently to add terror to the spectacle, some were scarlet and some picked out in fantastic patterns. Our pair charged this motley group, broke up the formation, and sent two crashing to the ground.

"It is only men who return victorious who can tell the tale of their fights. What of the men who do not return? I can at least say this: that though our machines are all day busy in the air above the enemy's country they seek many more opponents than will face them, and the enemy's losses in purely fighting machines are enormously greater than ours. His plan when he attacks is to mass his planes against a single observer, knowing that most observing planes are no match for the fighter.

AVIATION IN PARLIAMENT.

Prince Frederick Carl's Body.

CAPTAIN D. HALL on April 26th asked the Prime Minister whether any application has been received from the Kaiser or the German Government through any neutral Power that the body of Prince Frederick Carl of Prussia, who died from his wounds while a prisoner in the hands of the British, should be handed over for interment in Germany; and whether, if such application has been made, or is made, the British Government will insist, as a condition for granting the same, that the bodies of Nurse Cavell and Captain Fryatt be handed over for fitting burial in this country?

Mr. Bonar Law: No official application has been received, but a verbal and private inquiry was recently made by the Sovereign of a neutral country, through the diplomatic representatives in this country, as to whether the body of the late Prince Frederick Carl of Prussia could be sent to Germany. The reply was given to the effect that it was impossible at present, but that, so far as we are concerned, there would be no objection to this being done on the conclusion of hostilities.

Leave for Anti-Aircraft Men.

SIR J. AGG-GARDNER in the House of Commons on May 2nd, asked the Under-Secretary of State for War whether the War Office will increase the opportunity of leave for anti-aircraft service men enlisted under the Derby scheme, for the most part married men, who have sacrificed remunerative

positions from patriotic motives and who, under present circumstances, are rarely allowed to revisit their homes more than once in ten months?

Mr. Macpherson: Leave is granted to these men whenever possible, but it depends on the availability of spare men. It is easier to grant leave during the summer than the winter without impairing the efficiency of the Service, and I hope that during the coming summer more opportunities may occur.

Details of Air Fighting.

Mr. G. TERRELL on May 3rd asked the Under-Secretary of State for War whether, in view of the heroism displayed by the members of the Royal Flying Corps, he will arrange for reports of aerial engagements to be published in greater detail, together with the names of the officers and men distinguishing themselves therein?

Major Baird: The reports of combats in the air are supplied by the officers and men who have been engaged in them, and are remarkable for their brevity. When such actions are considered by the Commander-in-Chief to be worthy of reward, short accounts are published, and it would be difficult to amplify those. With regard to the second part of the question, I may remind my hon. friend that, as pointed out in a reply given by the Financial Secretary to the War Office on July 13th, 1916, those actions which appeal to the public are not necessarily the most commendable, and only the Commander-in-Chief is in a position to judge in what cases the names of those participating should be made public.

SOME METEOROLOGICAL CONDITIONS WHICH INCREASE THE DANGER OF FLYING.*

By Captain C. J. P. CAVE, R.E.

It may seem rather presumptuous for one who does not himself fly to discuss the dangers that may be met with in the air, as though a landsman who had crossed the Channel a few times were to write on the navigation of a ship across the ocean. At the same time, it may be of some use to point out certain conditions of the atmosphere which seem to me to constitute dangers, although I may be mistaken in my estimate of some of these, and would welcome any information from pilots bearing on the subject. In fact, my paper is meant to elicit information rather than to give it.

At the same time I should like to protest very strongly against the idea that we have made so much progress in the science and art of aviation that we can afford to disregard the weather altogether, except perhaps in the case of fog. The idea is a common one, and has been often stated, but it seems to me that it is a most dangerous idea to foster. An airman cannot afford to disregard the weather any more than can a seaman. A seaman puts to sea in almost any weather, but the fact that storms take their toll of shipping is a proof that seamen cannot entirely disregard these things. Neither are airmen immune. Only last summer it was stated in our official *communiqué* that five of our aeroplanes had failed to return owing to a severe rainstorm.

Probably what is meant when it is stated that airmen can afford to disregard the weather is that so much progress has been made in the construction and design of aeroplanes, that they can go up in almost any wind and can fly safely

I do not know that there were any aeroplanes flying when the gale began; probably not. The gale began in the afternoon in the south-west of England, but it did not reach the South-Eastern Counties nor the north-east of France till after dark. But a gale of 80 m.p.h. 140 ft. above the ground must have been considerably more at a height of 1,500 ft., and I venture to think that if aeroplanes were flying when such a wind sprang up many would have failed to return to their aerodromes. If at the same time there were a development of low clouds when such a gale came on, aeroplanes would be likely to lose their bearings entirely.

Besides the loss of aeroplanes actually flying, a gale such as the one under discussion would cause severe damage to hangars and tents, and I believe that on this occasion considerable damage was caused in this way. Anyone who was in north-eastern France at the time may remember the tiles and chimney-pots with which the roads through villages were strewn.

Gales may spring up with great suddenness at all times of the year; in fact, I think that a summer gale may often give less warning of its approach than a winter one. Anyone who has done any sailing around our coasts must remember cases when they have been caught in gales a couple of hours or so after having been lying becalmed. I think that easterly gales in the summer are apt to spring up suddenly in this way.

A gale, however, usually gives warning of its approach,

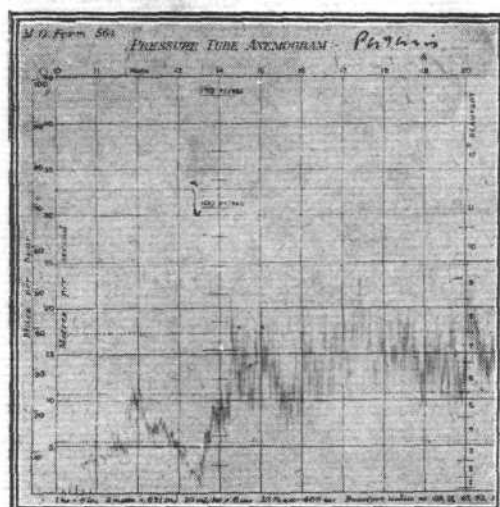


Fig. 1.—Anemogram, Falmouth. December 28th, 1914.

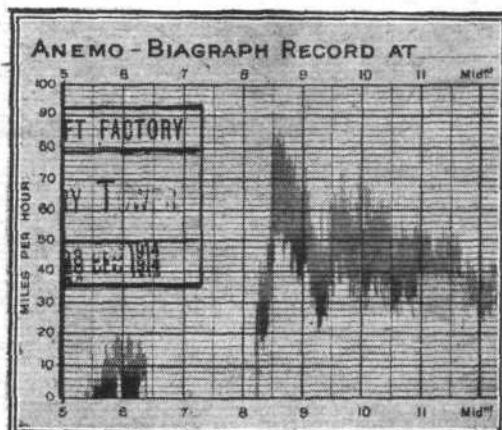


Fig. 2.—Anemogram, Farnborough. December 28th, 1914.

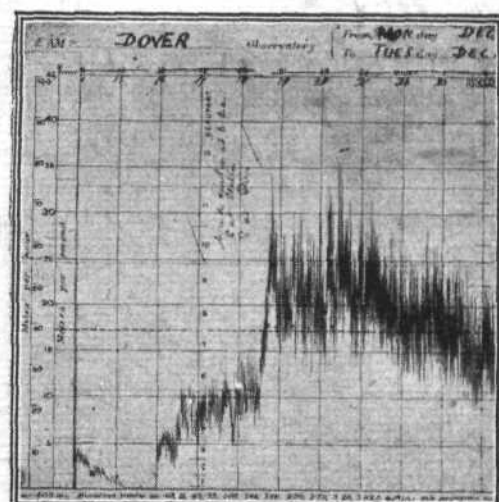


Fig. 3.—Anemogram, Dover. December 28th, 1914.

in winds that would have proved fatal to machines a few years ago. But there remain some conditions that are dangerous, and many that are severe hindrances to aeroplane work in war.

The chief conditions that suggest themselves to my mind as increasing the risks of flying are the following: (1) Gales; (2) squalls; (3) bumps and eddies; (4) clouds; (5) rain, hail and snow; (6) fog; (7) lightning. It is possible that the number might be added to by experienced pilots, and it is also possible that some of the conditions that seem to me to be dangers may not really be such, but I suggest them in the hope of getting more information.

(1) *Gales*.—In the early days of flying strong winds were more formidable than to-day, but there are still occasions when the wind is so strong that machines are able to make little or no headway against it, and such a strong gale may arise with great suddenness and sometimes without much warning.

An example occurred on December 28th, 1914, when a small depression formed over the Bristol Channel and passed across the south of England, causing a gale that did a considerable amount of damage. In the south-east of England it was nearly calm before the onset of the gale, which sprang up with great suddenness. At Farnborough, for instance, an anemometer exposed 140 ft. above the ground level registered a velocity of 80 m.p.h., when only a quarter of an hour previously it had been quite calm (see Figs. 1, 2 and 3).

* A Paper read before the Aeronautical Society of Great Britain on Wednesday, May 2nd, 1917.

and may often be forecasted many hours in advance, and the weather map for the day will usually indicate when a gale is likely.

(2) *Squalls*.—A squall is a temporary rise in the wind above the mean velocity that precedes and follows it, the rise in velocity being continued over some minutes at least, and is thus distinguished from a gust, which only lasts a small part of a minute. Squalls are of innumerable degrees of severity. On a day of blustery north-west winds, when there are large cumulus clouds about, one may have a succession of squalls, whose approach can be seen at sea some time before their onset. Such squalls are probably not of any particular danger to aeroplanes, as at sea they are not of much danger to shipping, except in the case of small open sailing boats, but in peace time at seaside resorts they take their toll of holiday makers who are sailing with the main sheet made fast.

More intense squalls are associated with thunderstorms, and they are all the more dangerous, since they are often preceded by very light winds or even by a complete calm, and within a minute or so from their onset the wind is blowing at the rate of even 60 to 80 m.p.h. A typical example of such a squall occurred on August 2nd, 1906. As seen in the east of Hampshire, this storm came up from the direction of the Isle of Wight in the shape of a huge cumulus cloud with a great extension of false cirrus at the top, giving it the appearance of a giant mushroom; the day had been very hot, and the air was very still. As the storm approached it was seen that heavy rain was falling, but there was no

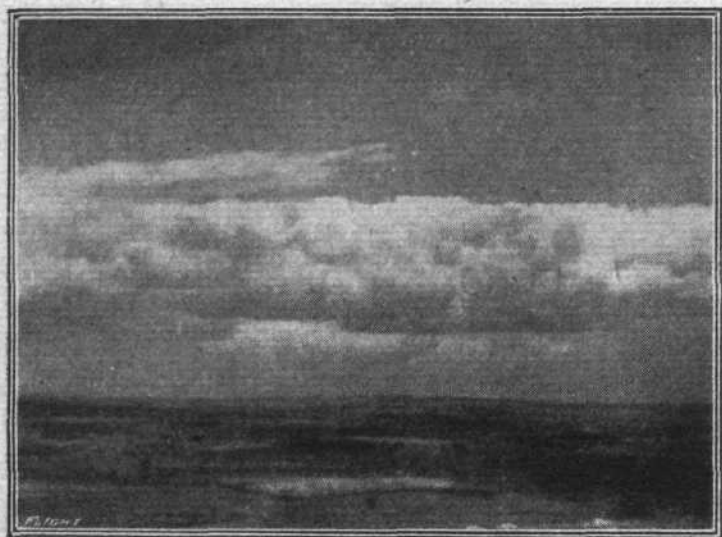


Fig. 4.—Part of a squall cloud. The cloud stretched right and left as far as could be seen; when it came overhead there was a moderate squall with snow.

sign of wind to the untrained eye. A few minutes before the rain reached the observer a continuous roar was heard, and as the first drops fell a furious blast of wind arose; the wind only lasted a few minutes, and in three-quarters of an hour

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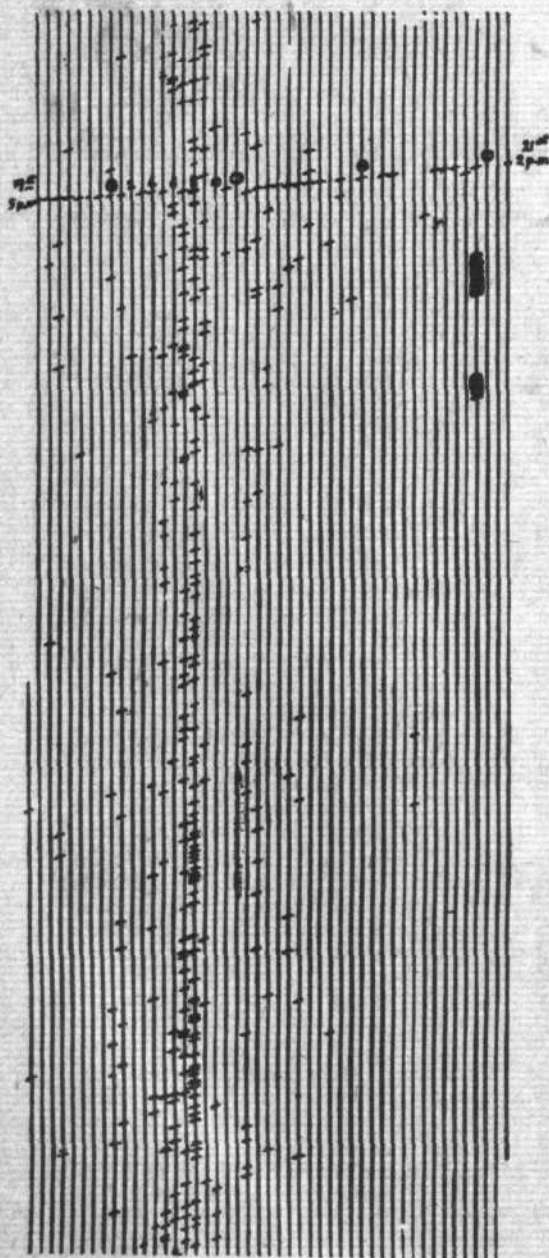


Fig. 5.—Trace of automatic lightning recorder, January 19th to 21st, 1916, South Farnborough. The cross strokes show the times at which flashes of lightning occurred within range of the instrument. The range was probably about 250 miles. The line of strokes near the top are time marks made every hour. ● is midnight, ○ midday.

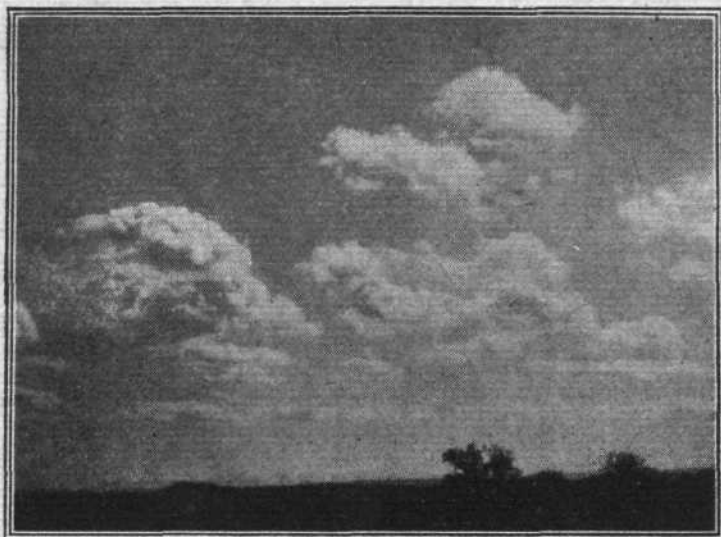


Fig. 6.—Very small cumulus clouds beginning to form.

the storm had passed and the weather was fine again. The storm passed over the South Downs, and the same storm or another moving parallel to it reached Guildford, where the damage done by the wind was very great. I cannot imagine that an aeroplane caught in such a squall would not have been in danger. Certainly an airship would have been in the very greatest danger, and could hardly have weathered the storm.

The squall in front of an ordinary thunderstorm is probably a modification of another variety known as the line squall. The sequence of events in a line squall is somewhat as follows: A bank of clouds is seen extending along the horizon, the upper parts being white and in shape like ordinary cumulus, though the whole cloud usually appears of a more uniform height, and not broken up into such distinct peaks as is ordinary cumulus (Fig. 4). As the cloud approaches it is seen to be extremely dark below, and it usually extends in a long line, stretching from horizon to horizon, but owing to the effect of perspective it appears like an arch in the sky, the summit of the arch coming nearer and nearer overhead. As the cloud reaches the observer a violent squall springs up, the wind veers rapidly or even suddenly, rain falls in torrents and is often accompanied by hail, and there may be thunder and lightning; at the same time the temperature falls considerably, a fall of 5° or 10° being common, and it is sometimes as much as 20°. When the cloud is approaching and is nearly overhead a curious sinuous line is seen at its base extending right along the front of the cloud, and it is this line which gives the name of line squall to the disturbance. After the first blast the wind blows strongly for a time, and the heavy rain lasts for half an hour more or less; this is followed by a less intense fall of rain and by decreasing wind, and after an hour or so the weather often clears up and becomes fine.

A line squall is only a few miles across, but it may be several hundred miles long, and it advances across the country broadside on at the rate of 20 to 40 m.p.h. One such squall has been traced from Cape Wrath to the centre of France, another from the north-west of Ireland to the centre of Germany. The list of disasters caused by line squalls is a long one. The best known case is that of H.M.S. "Eurydice," a training ship homeward bound, that was struck by such a squall when off the Isle of Wight on March 24th, 1878, and foundered with heavy loss of life.

Besides the blast of wind in front of the squall, there are great up currents in front and down currents near the middle of the squall, with much eddy motion between them. Such conditions could hardly fail to be dangerous, and though an aeroplane might possibly come safely through them, it is hardly likely that an airship would.

The onset of a line squall is generally sudden, though anyone with a very little training in meteorology can see it coming while it is still some way off. On January 20th, 1916, a line squall passed across the country from north-west to south-east, reaching Farnborough at 10.30 a.m. The morning had been fine, and a number of machines were out on the Common; the squall came on suddenly, and several machines were damaged before they could be got back into their sheds. A storm such as this one can be predicted with some success if the machinery is ready for the purpose. The general conditions favourable for line

squalls can usually be forecasted from the Daily Weather Map prepared at the Meteorological Office, but unless a line squall occurred at one of the Meteorological Office Observing Stations at the time of the taking of the meteorological observations or shortly before, the existence of the squall may not be noticed on the map. The squall of January 20th, 1916, which was not particularly severe, was first observed in the south of Ireland at about 4.30 a.m. It was accom-

(3) *Bumps and Eddies*.—I do not propose to deal with these at any length. The danger from bumps is small with modern aeroplanes, though in the early days of flying they were a source of great danger. Pilots are far better qualified to speak of bumps than is a meteorologist who has been only taken in the air a few times as a passenger. Bumps are mostly due to rising currents of air over surfaces of the ground that are at different temperatures, and to eddy motion due

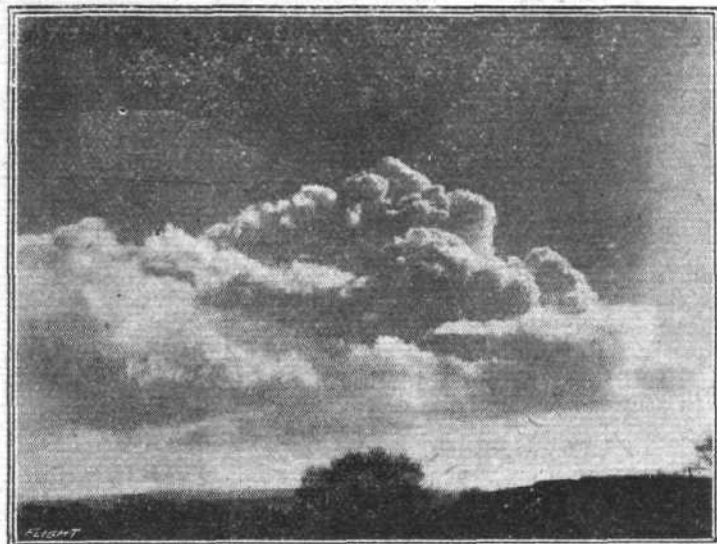


Fig. 7.—Simple cumulus with hard-edged rounded top.

panied by much thunder and lightning. It crossed the Irish Sea and reached the coasts of Cornwall and Wales at about 7.30 a.m., and moved across the country in a line 100 miles long or so, the movement being, as usual, at right angles to its length. Now this storm did not affect any of the Meteorological Office Observing Stations, and hence its existence was not known officially, as one may express it. But since a squall of this type is perfectly easily recognised, its coming might have been foretold if the proper machinery had been in existence to deal with it; such a warning might have been received in plenty of time for the aeroplanes on the Common at Farnborough to have been put in their sheds in safety.

That there is time for such warnings to be given is shown by the fact that recently I had a telegram from Upavon telling me that a line squall had just passed over. The telegram was received about 10 minutes before the squall, which was not at all a severe one, reached Farnborough. Ten minutes is doubtless too short a time for the warning to be acted upon, but a station further west than Upavon could have sent a warning that would have been received in plenty of time.

It appears to me that it would be quite feasible for an observer at every aerodrome to send a telegram to some central office when a line squall took place. At the central office the general weather conditions would be well known, and therefore the direction of motion of the squall could be foretold. In addition, other reports would come in as the squall reached other aerodromes, and the rate of travel could be obtained with some accuracy. Warning could then be sent to all aerodromes which were likely to be affected, and some signal might be hoisted in a conspicuous place where it could be seen not only by those who were responsible for machines on the ground, but also by pilots who were flying in the immediate neighbourhood of the aerodrome. Some such organisation would not be complicated, and would only occasionally have to be put into use, but it might be the means of saving machines, and possibly lives also. If the information were to be sent out by wireless the warnings would be received still earlier. But weather forecasts are looked on in some quarters as the subjects for jokes, and it will take some serious accidents caused by line squalls before anything practical is likely to be done. A severe line squall is generally accompanied by thunder and lightning, and an automatic lightning recorder would indicate its approach, especially in winter, when thunderstorms are almost entirely of the line squall type. The lightning recorder at Farnborough began to record lightning at about 5 a.m. on January 20th, 1916, and it was quite evident from the chart that something quite out of the ordinary for the winter was occurring (see Fig. 5).

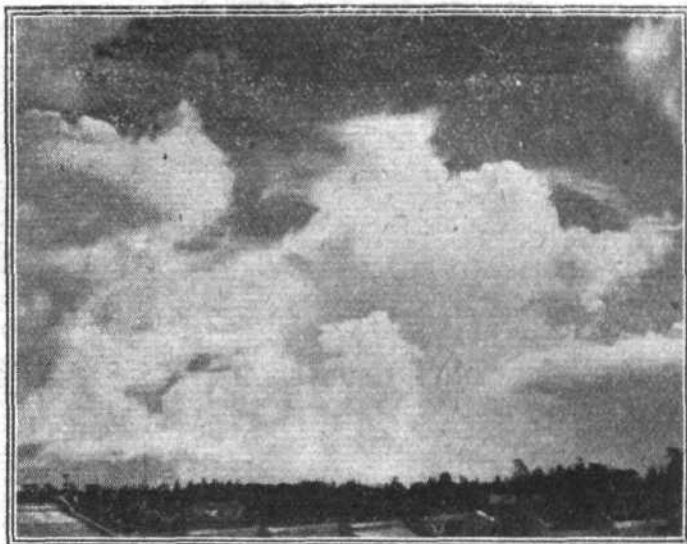


Fig. 8.—Cumulus beginning to turn into cumulo nimbus; the top of the cloud in the centre is becoming soft-edged and fibrous.

to the wind blowing over irregularities of the surface. They also seem to occur at the cloud layer when there is a sheet of cloud, and they occur, of course, with cumulus clouds.

In this connection there is a point on which pilots could give some information. At Farnborough an easterly wind is far more bumpy than a westerly wind. Is this due to some local configuration of the ground, or is it something inherent in an easterly wind? I suspect that there is some connection between bumpiness and easterly winds, but what it is I cannot

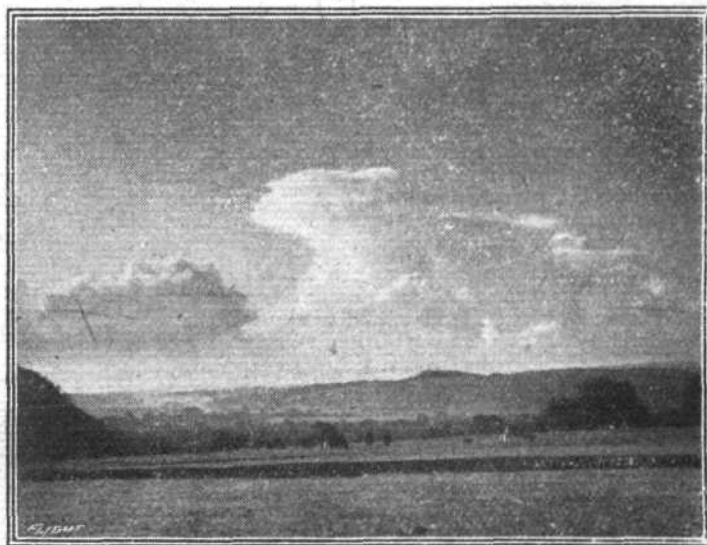


Fig. 9.—Fully developed cumulo nimbus; the whole top of the main cloud is a mass of false cirrus. Note the difference between the top of the main cloud and that of the small cumulus on the left.

attempt to explain. An easterly wind has, seemingly, peculiarities of its own. It is said, for instance, that there is always more sea in the Channel with an easterly wind than with a wind of corresponding strength from other quarters.

(4) *Clouds*.—Clouds may be a danger in several ways. In the case of cumulo nimbus clouds the heavy rain, and possibly hail, or snow in the winter, may prove extremely dangerous. Such clouds, too, are often of great extent,

and are the seat of very rapidly ascending currents of air. A pilot might have to fly a considerable distance before getting clear, and might easily lose his bearings. A cumulo nimbus cloud is one that should be avoided if it is possible to do so, and as these clouds often occur in isolated masses, it may be at times possible to fly round them. A cumulo nimbus, the true shower cloud, from which rain, hail or snow is falling, may be distinguished from simple cumulus by the fact that the top of the former cloud, instead of being rounded and hard-edged, is brushed out into a soft-looking mass of fibrous cloud called false cirrus. It is true that

to which the line squall disturbance extends; it probably varies on different occasions.

Hailstones in summer thunderstorms constitute a real danger to an aeroplane that might be involved in the storm, for they sometimes attain an enormous size. In the British Rainfall Organisation's volume for 1913 is a photograph of hailstones that fell in Essex on May 27th of that year. Although they had partially melted before they were photographed, they are still shown as nearly as large as a hen's egg that was photographed with them for comparison (Fig. 11). They fell at Wickham St. Pauls, near Halsted,



Fig. 10.—Weather map for 7 a.m., December 24th, 1916. (From the Daily Weather Report of the Meteorological Office.)

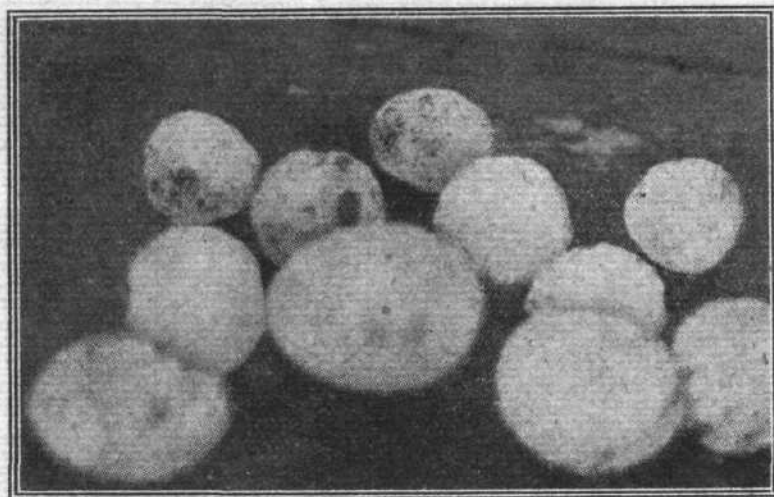


Fig. 11.—Hailstones which fell at Wickham St. Pauls, May 27th, 1913. From "British Rainfall" for 1913.

showers fall from simple cumulus clouds, but the really heavy falls are from cumulo nimbus.

Cumulus clouds are more common in summer than in winter. They usually begin to form in the morning as the day gets warm, and reach their greatest development about two or three in the afternoon, after which they generally begin to disappear, and by sunset or soon after the sky may be quite clear even after a day of great development of this form of cloud. But they may be met with at other times, and they form after sunset in the summer when shallow depressions, bringing thunderstorms, are approaching.

Low sheets of cloud may prove a hindrance to work with aeroplanes, and if they are very low they may cause difficulties for a pilot in finding his way back to the aerodrome, or even difficulties in landing at all. The possibility of low sheets of cloud forming after a clear morning, especially in winter during unsettled weather, should always be borne in mind. A glance at the latest weather map will often be a valuable guide as to whether a fine morning is likely to last. Take, for instance, the map for 7 a.m. on December 24th last (see Fig. 10). This shows that the sky was clear in North-Eastern France, but subsequent reports show that it became overcast and rainy, and that there was a great extension of low cloud. Anyone who had in the least followed the weather on the days preceding this date and who had seen the map for the day, or even for the preceding evening, would have realised that the fine morning was not likely to last beyond a very short time. I maintain that aeroplanes going up on such a morning would have been extremely likely to find low clouds extending to within a few hundred feet of the ground before their return, and they would therefore be in some danger. It might be that it would be necessary to incur the danger, that it was worth incurring the danger for the results that might be obtained, but it would be absurd to say that such meteorological conditions would not add to the risks of flying.

(5) *Rain, Hail and Snow.*—The danger arising from these is obvious, and it varies, of course, from nothing in the case of very light falls to a real danger in the case of very heavy falls. Danger from very heavy rain or from hail can often be avoided by keeping away from cumulo nimbus clouds. Such clouds are often seen in isolated masses, some miles in circumference perhaps, but still they can on such occasions be avoided. In the case of a line squall it is, however, not possible to fly around the cloud, for this often extends in a long line for several hundred miles. It might be possible to fly over a line squall and so avoid the rain, hail and turbulent motion of the air associated with the disturbance, but I do not know that there is any evidence as to the heights

in Essex. At Great Yeldham there was a fall of similar hailstones. At the latter place the fall lasted only eight minutes, but "the devastation was great," an observer says. "Crops were smitten to the ground, glasshouses all smashed, tarred roof felting cut to ribbons, corrugated iron riddled, tiles and windows smashed in thousands. . . . Man and beast were bruised, and among other animals killed on my own farm I saw rooks, wood pigeons, full-grown hares, partridges, pheasants, rabbits and various small birds, wild ducks, farmyard fowls and three cygnets." At Haverhill the stones varied from the size of nutmegs to that of walnuts. At Harston the stones were $1\frac{1}{4}$ in. in diameter, and at

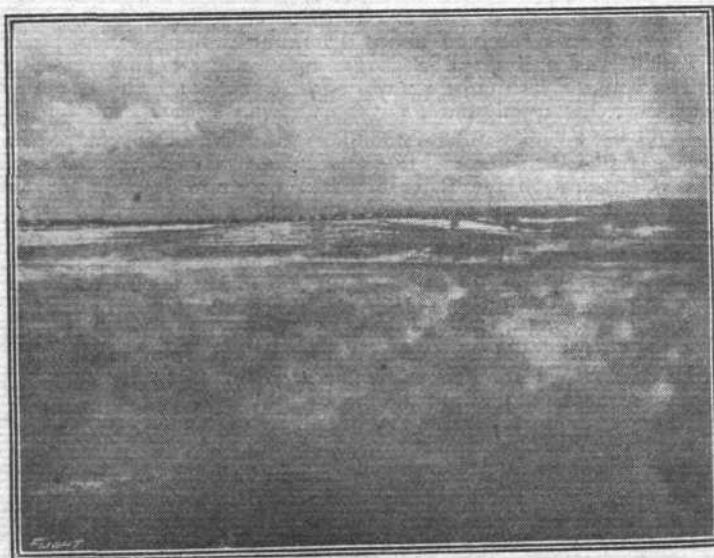


Fig. 12.—Fog forming on the aerodrome at Farnborough when a snow shower was followed by bright sunshine.

Sheerness $\frac{1}{2}$ in. to $\frac{7}{8}$ in. Damage from hail was reported from a wide region in the Eastern Counties on this day.

Doubtless it will be said that this was an exceptional occasion, and no doubt it was, but a glance through one of the Rainfall Volumes shows that very heavy falls of hail occur in the summer months in all parts of England. For instance, besides the 24th of the month, heavy falls occurred in May, 1913, on several occasions; on the 19th very heavy hail fell at Bolerno, in Midlothian; on the 26th hailstones over 1 in. in diameter fell at Bulvan, and at Bishops Castle

scores of windows were shattered; on the 30th at Gravesend the hailstones were $1\frac{1}{2}$ in. in diameter; on the 31st at Waltham, on the Wolds, there was an exceptionally heavy fall of hail.

A glance through the records for any summer month shows that so-called exceptional falls of hail are fairly common, and it scarcely needs pointing out that hailstones far smaller than hen's eggs would have fatal effects on an aeroplane that met them.

(6) *Fog*.—Perhaps fog is one of the worst of the dangers that beset flying, and I should like especially to call attention to fog to those who maintain that at the present time aviators can afford to disregard the weather. The subject of fog, however, has lately been dealt with before this Society by Major Taylor. I may, however, give an example of how a fog may be formed by the mixing of air at different temperatures. On April 3rd of this year there was a shower of snow at Farnborough which was followed immediately by bright sunshine. After a few minutes a mist began to form over the aerodrome, and for a short time wreaths of fog covered the Common. No doubt the sun heated the ground and warmed the air in contact with it. The relatively warm air, which would have been fully saturated, was mixed with the cold layer just above—air that had been cooled by the melting snow before the sun came out. The saturated warm air was chilled and its moisture was condensed into fog.

(7) *Lightning*.—It is difficult to say what is the danger to be apprehended from lightning as such. The dangers to flying from thunderstorms are due to the squalls and to the heavy rain and hail that accompany them. It is possible that the actual danger from lightning to an aeroplane flying through a thunderstorm may be no more than that incurred by a pedestrian walking across an open common during a storm. A pilot who was flying above a thunder cloud last summer reported that long sparks were given off by his machine at intervals. It is very likely that this happened

every time there was a flash of lightning from the cloud below him. But no inconvenience was caused by the sparks. In the case of an airship, however, it would be far otherwise, for quite small sparks might ignite the hydrogen. Lightning is also a danger to kite balloons, owing to the conducting wire. There are several cases on record in which meteorological kites have been struck by lightning, and as some of these occurred when there was no thunderstorm in progress, it must be remembered that clouds may be highly charged with electricity at times when no actual storm is going on.

There is a particular type of violent thunderstorm in which most of the lightning takes place from cloud to cloud, and when it is almost incessant. It would probably be dangerous for an aeroplane to enter such a cloud, but the appearance of the danger is so obvious that it scarcely needs pointing out.

I hope that I have made it clear that the airman is not entirely immune from the disturbances in the medium in which he flies. If I could persuade aviators in general to take meteorology rather more seriously I should feel that I had not read this paper in vain, but I am afraid that weather maps and forecasts are looked on by many, though not by all I am glad to think, as mere matters of guesswork, and not worthy of serious consideration. The public in general exhibit a lamentable ignorance of the very elements of meteorology, which is largely due to our educational methods. I do not wish everyone to become a meteorologist, but there is no reason why everyone should not take an intelligent interest in the movements of depressions and anticyclones, and have some faint knowledge of what these terms mean. The English are supposed to talk so much about the weather that it is a pity they should not know what they are talking about, and those who are responsible for the safety of aeroplanes and airships ought to know as much about the weather as, say, a master mariner in the mercantile marine. There are cases where ignorance may be criminal.



Torpedoes from Aeroplanes.

THE Admiralty made the following announcement on May 2nd:—

"The British steamship 'Gena' was sunk yesterday (Tuesday) by a torpedo discharged from a German seaplane off Aldeburgh. All hands were saved. Another seaplane concerned in this attack was brought down by gunfire from steamship 'Gena,' and the crew were made prisoners."

The following is the German version of the incident sent out from Berlin on May 2nd:—

"Yesterday morning a number of our seaplanes attacked some enemy merchant ships off the Thames and sank a large steamer of about 3,000 tons. One of our machines has not returned, and it is supposed that it is lost."

In connection with the above, it is stated by the Admiralty that this method of attack was first practised successfully in August, 1915, by R.N.A.S. pilots, who sank several ships in the Dardanelles by torpedo from seaplanes.

Fatal Accidents.

At the inquest on Lieut. F. N. Clarke, R.F.C., who was fatally injured at Streatham, on April 29th, a witness said he saw the machine flying quite low. It then went up, flew in a circle, and gradually descended. Apparently the pilot tried to rise, but was too late, and the machine struck the chimney. Capt. Vivian Davis, R.F.C., said the deceased was a qualified pilot, and was ready to proceed overseas for service. The aeroplane was tested before it left the aerodrome, and was in perfect condition. A verdict of "Accidental Death" was returned.

Flight-Sergt. W. E. Stedolph, R.F.C., was killed on May 1st through his machine apparently getting into a spin and crashing to the ground.

While flying in Suffolk on May 2nd, Sec. Lieut. J. W. Purvis met with a fatal accident. At the inquest an instructor said he thought the machine must have touched the top of a tree, resulting in a nose dive. A verdict of "Accidental Death" was returned.

"Death from Misadventure" was the verdict at an inquest on 1st Air-Mech. A. Weavers, who was burned to death in Kent. He was observing in a biplane, when the machine, side-slipping soon after leaving the ground, struck a building and broke into flames. The pilot was rescued, but the men who rescued him did not notice Weavers, and, according to the evidence

at the inquest, it would have been impossible to have rescued him owing to the flames.

Lieut. Foote, R.F.C., was killed on May 4th while flying at Montrose. When 50 feet up the aeroplane dived to earth and burst into flames. The fire was so fierce that no one could render assistance to the pilot, who was burned to death. The aeroplane was completely consumed.

Lieuts. Trollope and Caldwell, R.F.C., were killed while flying in Yorkshire on May 4th.

The body of Lieut. Gibson Turnbull, R.F.C., was discovered in the River Nidd on May 5th by his wife while walking on the river side. It was stated at the inquest at Knaresborough that Lieut. Turnbull on April 15th, after alighting in a field, rose again, but collided with a hedge, and his machine dived into the water. The airman's neck was broken. A verdict of "Accidental Death" was returned.

American Aviator Killed in France.

WHILE flying with a French pilot in France on April 24th, an American aviator named Hoshier was killed.

Two Prominent Austrian Pilots Killed.

AUSTRIA has recently lost two of her best known pilots, according to reports received in Amsterdam. Lieut. Souhrada was killed when his machine was brought down by French aviators on the Roumanian front, and Lieut. Glanz was killed whilst trying a new machine at a Vienna aerodrome.

Aerial Battles at Salonica.

"In the fighting on the Doiran sector the Royal Flying Corps have taken a full share," wrote Mr. Gerard Price, from Salonica on April 30th:—

"Few warlike spectacles that can be imagined are more impressive than the encounter the other evening at 10,000 ft. above the trenches of 21 British aeroplanes with a rather larger number of the enemy. Ours was a bombing expedition. As they approached their objective a similar squadron of highly powered and heavily armed German aeroplanes came in sight to meet them. There was a rattle of machine guns as the opponents wheeled and dived and manœuvred, and soon the sky was thickly flecked with round white shrapnel bursts as the anti-aircraft guns, both theirs and ours, came into action to support their own flying men. One machine was brought down by either side, but the Englishmen dropped their bombs and achieved their mission. Besides the Halberstadt scouts and Albatroses, the enemy has here a much larger type of double-engined machines. It carries two observers and one pilot and four machine guns."

LONDON PRESENTS AN AEROPLANE TO SOUTH AFRICA.

THERE are many people at the present time who, while they quite realise the important rôle which the aeroplane is now playing and will continue to play in warfare, do not perceive that aircraft will, after the war, be an important factor in commerce and communication. This aspect was one which was emphasised by Lieut.-Gen. Smuts, on Saturday last, in accepting on behalf of South Africa, an aeroplane which has been subscribed for by members of the London Chamber of Commerce, and presented through the Imperial Air Fleet Committee. The actual ceremony of naming the aeroplane which was performed at Hendon by Mrs. Schriener, wife of the High Commissioner of the Union of South Africa, was preceded by a luncheon at the Connaught Rooms. Lord Desborough, who is President of both the London Chamber of Commerce and the Imperial Air Fleet Committee, presided, and in addition to Lieut.-Gen. Smuts, the guests included Lieut.-Gen. Sir David Henderson, K.C.B., D.S.O., the Hon. William P. Schriener and Mrs. Schriener, the Marchioness of Winchester, the Rt. Hon. Lord Aberconway, the Rt. Hon. Lord Glenconner, Sir Owen Phillips, K.C.M.G., M.P., the Rt. Hon. Sir T. Vezev Strong, K.C.V.O., Mr. Lionel A. Martin, Mr. F. Faithfull Begg, Mr. Stanley Machin, Mr. Albert H. Sytner, Mr. Alfred Docker (Chairman of the Imperial Air Fleet Committee), the Hon. Sir John A. Cockburn, K.C.M.G., Sir Algernon F. Firth, Bart., the Hon. Sir J. W. Teverner, K.C.M.G., Sir Harry F. Wilson, K.C.M.G., Sir Robert Hadfield, Brig.-Gen. Brancker, Brig.-Gen. W. A. Caddell, Major Van der Spuy R.F.C., Major Lord Roberts Innes Kerr, R.F.C., Capt. A. Hambro, M.P., Capt. Wilkinson, D.S.O., R.F.C., Capt. B. C. Hucks, R.F.C., Capt. Turner, R.F.C., Capt. Lyons, R.F.C., Capt. Hope, R.F.C., Mr. John Cates, Mr. C. J. Fairfax Scott (Hon. Sec. Imperial Air Fleet Committee), and Mr. Charles E. Musgrave (Secretary of the London Chamber of Commerce).

Mr. Lionel Martin (Chairman of Council, London Chamber of Commerce), in asking the Imperial Air Fleet Committee to accept the aeroplane, spoke of the splendid way in which South Africa had not only driven the invaders out of her own country, but also come forward magnificently to help in the struggle for liberty.

In accepting the gift, Lord Desborough said the objects of the Imperial Air Fleet Committee were to draw the attention of the Empire to the necessity for increasing the means of Imperial defence, and to present each of the self-governing Dominions with an aeroplane with the best wishes of the donors. With the gift by the Newcastle Chamber of Commerce of an aeroplane to New Zealand the second part of the Committee's work would have been accomplished. He mentioned that it was the intention of the Committee to present a gold plaque, similar to those presented to other distinguished flying men, to Lieut. Pyott, D.S.O., the South African who brought down a Zeppelin off Durham. Lord Desborough, in asking Gen. Smuts to accept the aeroplane on behalf of South Africa, spoke of the splendid work of the South African aviators in South-West and East Africa and in France.

Gen. Smuts, who was warmly cheered, reminded his hearers that South Africa early realised the possibilities of the air, and in the Defence Act in 1912 provision was made by the Union for the inclusion of aeroplanes as part of the defence system. Schools were started, and, after training, a number of pupils were sent to England for a finishing course. Realising what an important war instrument the aeroplane was going to be, they ordered a number of machines of a new type. They turned out so good and so promising that the War Office wanted to keep them for France, and it was only with the greatest difficulty that he succeeded in getting some of them for South-West Africa. In that campaign, however, it was not possible to make extensive use of the aeroplane, because not only is the country so sandy that once an aeroplane comes down it cannot rise again, but it is so bushy that it is difficult to get up. In spite of the difficulties, however, very fine work was done by the flying officers. In East Africa the conditions were still harder, for the country was still bushier and more afforested, and, moreover, was at a great elevation. Nevertheless, some excellent scouting was done both by the South African and the R.N.A.S. officers. Gen. Smuts emphasised the splendid assistance rendered by the aeroplanes in the destruction of the "Königsberg," and how quickly the Belgians, as soon as they obtained seaplanes, made short work of the German supremacy on Lake Tanganyika. The German askaris had a great horror of the British bombardment, which followed them wherever they went, and a

native non-commissioned officer questioned by Gen. Smuts, said that when he was standing by a river swarming with crocodiles and saw "The Bird" coming his first inclination was to jump into the river.

The new aeroplane, continued Gen. Smuts, would be sent to the Western front, where there had been a tremendous struggle for air supremacy. The Germans had brought forward a large number of machines of a new type, very fast and very deadly. It seemed for a time as though our position was in danger. But "our boys" made the most gallant fight possible, sometimes with inferior machines, and he never saw a German machine cross our lines. Of all warfare scouting was the most dangerous. We had our casualties, and to some extent we should have our casualties still. He hoped our supremacy would be maintained, as it was a factor which would contribute very materially to our ultimate success.

The war had brought forward a number of new features. There was the submarine, and we saw how far it was going in its recent developments to undermine the very foundations of sea power. He was not a pessimist, but he was sure this weapon would be fought efficiently and to its end, but until that was done we were passing through an anxious period, and a period during which those in charge of our air services and our war machine will have to turn every attention to this great problem. Wireless telegraphy was another great innovation, of which he had special experience in East Africa, where the use of telegraph or telephone is impossible. The third novelty in the present war, the aeroplane, was probably going to prove the most important of all, not only from the military point of view, but afterwards, in time of peace, from a commercial point of view. Time and space were the two great enemies in the development of the human race, and one of the most efficient instruments ever discovered to help in the struggle against time was the aeroplane. When the war was over we should have an immense number of aeroplanes, which could be switched over to better uses than war, and he was glad the Government had appointed a Committee to investigate this matter. Ours was a commonwealth of nations—he did not like the word Empire. By the air they could be bound together as by no other thing. This commonwealth was scattered all over the world, and this trouble of time and space was a greater trouble to us than it was to any other state. If we could turn these war devices to uses in peace we would do a very great thing for this commonwealth to which we belonged.

Brig.-Gen. Brancker expressed the thanks of the War Office for the generosity of the donors. As to our air supremacy, not once had the Germans prevented our flying officers from performing the duties which the Army demanded of it, and after hard and bitter fighting for two months they had again, very distinctly, gained the upper hand over the Germans. Losses could always be avoided by lack of enterprise, but the Royal Flying Corps had carried out its duties, had faced its losses and had won its victory. Our aerial offensive had caused the Germans much severer losses than ours, and besides had deteriorated their morale. Success had come earlier than he had hoped for, and the output of our new aeroplanes and engines was improving, and he hoped would soon be much better if the labour troubles which were again threatening could be avoided. The success in the air might be only temporary, and efforts to improve and extend it must go on incessantly. They, in the Air Services, thought that the antidote to the submarine was in the air, and already that work was being undertaken. Referring to the development of civilian aeroplanes, the speaker pointed out how that was not being lost sight of, and said the time was coming when we should have a line of aeroplanes running from London to Pretoria and Cape Town, via the country Gen. Smuts had conquered for us.

Mr. Stanley Machin stated that any balance of funds would be handed over for the benefit of the Royal Flying Corps Hospital.

Lord Desborough, on behalf of the Imperial Air Fleet Committee, sent a telegram to the King, to which the following reply was received:—

"I am commanded by the King to thank you for your message, and to assure you of the pleasure it afforded His Majesty, as Colonel-in-Chief of the Royal Flying Corps, to learn that the Union of South Africa have accepted, through General Smuts, the aeroplane presented by your committee.—(Signed) Private Secretary."

After the luncheon the aeroplane was formally presented to Gen. Smuts at Hendon, where it was flown by Capt. B. C.

Hucks, R.F.C., who took up Lord Desborough on one of the trips, and looped several times.

Gen. Smuts said he accepted the aeroplane on behalf of the South African Government as a bond of union between this nation and the nation growing up in South Africa, and expressed to Gen. Sir David Henderson the hope that this machine would help to maintain the superiority in the air which the service he so ably commanded had attained. Sir

David Henderson, on behalf of the Royal Flying Corps, took over the machine on the stipulated conditions, namely, that it should be sent to France as soon as possible, and that after the war, the machine itself, or its successor, should be handed over to the South African Government.

The machine was named by Mrs. Schriener breaking a bottle of wine over the propeller, and the Marchioness of Winchester affixed a springbok's head to the aeroplane as a mascot.



Casualties.

Second Lieutenant LAWSON E. ALLAN, Yeomanry, attached R.F.C., who was killed on April 26th, was the youngest son of Mr. and Mrs. James Allan, of Oxton, Cheshire, his father being sub-manager of the London and Lancashire Fire Insurance Company. Educated at Sedbergh, he secured a commission in the Yeomanry two years ago. In November, 1915, he went to the front as signalling officer, and a year later joined the R.F.C. as an observer. He was due home shortly to qualify for his pilot's certificate.

Lieutenant ERIC ARTHUR BARLTROP, R.E., attached R.F.C., was the eldest son of the late Rev. A. H. Barltrop and of Mrs. Barltrop, of 12, Albany Road, Bedford. He was educated at St. John's School, Leatherhead, and at Queen's College, Cambridge, where he took his B.A. degree. On the outbreak of war he enlisted in the Royal Engineers, receiving his commission in the same corps in November, 1914, and being promoted Lieutenant in the following March. In September, 1915, he proceeded to Gallipoli, where he was employed as Brigade Signal Officer, and, on the evacuation of the Peninsula, he was sent to Egypt, where he contracted typhoid, and was invalided home in February, 1916. He joined the Royal Flying Corps in the following October, and, receiving his pilot's certificate on March 28th last, joined his squadron at the front immediately. On April 23rd, during an action in the air, he was shot through the head and killed.

Captain SEYMOUR BARNE, Hussars, attached R.F.C., was the youngest son of the late Lieutenant-Colonel St. John and Lady Constance Barne, of Sotterley and Dunwich, Suffolk, and nephew of the late Marquess of Hertford. He was educated at Eton, and, joining the Hussars, was with his regiment during the retreat from Mons, and was wounded at the first battle of Ypres. He received the Military Cross. Since 1915 he has held a Staff appointment with a cavalry brigade. Recently, however, he felt it his duty to volunteer as a cavalry observer with the Air Service. In this capacity he was flying over the line on April 23rd, and was shot down by an enemy aeroplane.

Second Lieutenant AUSTIN BONNER, R.F.C., who is reported killed in action on April 30th, was the youngest son of the late Henry Bonner and Margaret E. Bonner, 31, Radnor Road, Handsworth.

Major HUBERT DUNSTERVILLE HARVEY-KELLY, D.S.O., Royal Irish Regiment, attached to R.F.C., missing, is a son of the late Colonel H. H. Harvey-Kelly, of the Indian Army, and was born in 1891. Entering the Royal Irish Regiment in 1910, he got his captaincy five years later. During the present war he became a squadron commander of the R.F.C., with the rank of major, has been mentioned in despatches, and was awarded the D.S.O. in 1915.

Second-Lieutenant CHAS. VERDON DARNELL, Connaught Rangers and R.F.C., killed in action on April 25th, was the only son of Dr. C. K. Darnell, Bangor, and was 22 years of age.

Flight Sub-Lieutenant HOLBROOK LANCE GASKELL, R.N., whose death in action is officially announced, was born in 1897, and was the youngest son of Lieutenant-Colonel and Mrs. J. B. Gaskell, of Roseleigh, Woolton, Lancashire. He was educated at Greenbank School, Sefton Park, Shrewsbury School, and was entered at Pembroke College, Cambridge, but joined the R.N.A.S. and took his pilot's certificate on June 24th, 1916. He left England for active service the last day of the same year.

Second Lieutenant LEWES WOODHAM MOTT, Essex Regiment, attached R.F.C. (killed in action on April 23rd), was only son of Mr. and Mrs. T. W. Mott, of St. Stephen's Lawn,

Cheltenham, and of Much Hadham, Herts. He was 20 years of age, and received his commission in January, 1915.

Lieutenant CYRIL JOHN PILE, Royal Field Artillery and R.F.C., killed in action, was 19 years of age and the youngest son of Sir Thomas D. Pile, of Kenilworth House, Willesden Lane. He had his commission in the R.F.A. Special Reserve in September, 1915, and was gazetted flying officer, R.F.C., in January, 1916.

Second Lieutenant HUGH PATER, West Yorkshire Regiment and R.F.C., who was accidentally killed while flying on April 17th, aged 28, was the eldest son of the Rev. S. Pater, rector of Sunderland. He was educated at Bow School, Durham, under Mr. W. H. Bramwell, and at Rossall School (Mr. Furneaux's house). For some years he was master at the Durham Cathedral choir school, and in September, 1914, he enlisted in the Public School Battalion, Royal Fusiliers. In June, 1915, he received his commission in the West Yorkshire Regiment. In August, 1916, he volunteered for the R.F.C. and on Saturday, April 14th, he received his certificate of efficiency and was expecting to be sent to the front immediately.

Second Lieutenant A. W. SPENCE, whose death has occurred from injuries received in an accident while flying in Kent, was 21 years of age, and was the younger son of Mrs. Spence and the late John Spence, of The Gabbs, Grove Park. He was educated at Haileybury College, and joined the Army on the outbreak of war. Second Lieutenant Spence served in France for many months in the Middlesex Regiment. Invalided home last year, he transferred to the R.F.C. Recently he was given his wings.

Second Lieutenant CYRIL HARVEY TROLLOPE, London Regiment and R.F.C., only child of Mr. and Mrs. John Basil Trollope, of 8, Oaklands Road, Bromley, Kent, and grandson of the late Joseph Harvey Trollope, of Queenswood, Beddington, Surrey, was accidentally killed while flying on May 4th. Born in 1897, he was educated at Colquhoun Villa and Larchfield School, Helensburgh, and at Fettes, where he was in Moredun House. He was in the O.T.C., and shot for the school team at Bisley in 1914. In 1915 he joined the London Regiment, in which he obtained his commission. He transferred to the R.F.C. in 1916, and received his "wings" shortly before his death.

Missing.

Major C. E. I. CHARLTON ANNE, R.F.C., who was last week reported missing and believed drowned on April 15th, aged 25, the youngest son of Major and Mrs. Anne, of Burghwallis Hall, Yorks, was the grandson of the late W. H. Charlton of Hesley Side, and the late Sir Thomas Parkyns, Bt., and cousin of Brigadier-General Charlton, C.M.G., D.S.O., R.F.L. At the outbreak of war he obtained a commission in the 6th Yorkshire L.I., but was shortly afterwards transferred to the R.F.C. He did excellent work at the front in 1915, but owing to an accident had to undergo a rather serious operation. Later, he undertook the training of pilots at home. His last post was that of Chief Instructor of a school of Military Aeronautics. He was mentioned in despatches last January. Major Anne leaves a young widow.

Second Lieutenant A. M. TURNBULL, R.F.C., officially reported missing since April 25th, is the eldest son of Mr. Martin H. Turnbull, solicitor, Chlorine Gardens, Belfast.

Married and to be Married.

The marriage between Captain J. HUMPHREY COTTON MINCHIN, the Cameronians and R.F.C., and Miss VIOLET FULLER, will take place at 1.45 p.m., May 17th, at Holy Trinity Church, Brompton.

The British Air Service

"PER ARDUA AD ASTRA"

Royal Naval Air Service.

Admiralty, May 2nd.
The following granted temp. commissions as Sub-Lieut., seniority as mentioned: A.B., R.N.V.R., F. C. Shirliffe, May 18th; late Temp. Prob. Flight Sub-Lieut. F. S. Russell, Mr. H. Odle, and Ord. Seamn., R.N.V.R., J. Feather.
The undermentioned entered as Temp. Sub-Lieut. R.N.V.R., both date May 1st: H. T. Rawlinson, and Leadg. Mech. C. P. Brady.

The following entered as Prob. Flight Officers, Temp., to date as stated: B. H. Bryers, April 24th; L. Balfour, G. Wake, and H. Cubitt, Mar. 28th.

Admiralty, May 3rd.
J. L. Cope, B.A., granted temp. com. as Lieut., R.N.V.R., and appointed to "President," additional, for R.N.A.S., date May 2nd.

O. L. P. Crowden and M. Stansfield entered as Temp. Lieuts., R.N.V.R., and appointed to the "President," additional, for R.N.A.S., to date May 2nd.
Leading Mech. (E) C. A. Proctor entered as Temp. Sub-Lieut., R.N.V.R., and appointed to "President," additional, for R.N.A.S., for engineering duties, date May 2nd.

Ord. Sman., R.N.V.R., W. Henson entered as Temp. Prob. Flight Officer, date May 7th.

Admiralty, May 5th.
Flight Commander R. J. J. Hope-Vere promoted to Acting Squadron Commander, seniority Feb. 21st.

F. Christie granted temporary commission as Lieut., R.N.V.R., seniority May 2nd.

K. G. Styles granted temporary commission as Sub-Lieut., R.N.V.R., seniority May 18th.

Admiralty, May 7th.
S. Gilfillan granted temp. com. as Sub-Lieut., R.N.V.R., seniority May 5th.

Royal Flying Corps (Military Wing).

London Gazette, May 1st.
Flight Commanders.—13th April: Lieut. (Temp. Capt.) E. E. N. Burney, M.C., R. Berks R., from a Flying Officer. From Flying Officers, and to be Temp. Capt. whilst so employed: 2nd Lieut. (Temp. Lieut.) F. D. Pemberton, R.A. 2nd Lieut. G. A. H. Pidcock, S.R.; April 14th. Temp. 2nd Lieut. K. Capel, Gen. List; April 16th.

Equipment Officer, 3rd Class.—Temp. 2nd Lieut. D. A. Parsons, attd. Bedf. R., and to be transfd. to Gen. List; Jan. 1st.

Adjutant.—Lieut. G. W. Panter, R. Ir. Rif., vice Capt. E. F. Campbell, K.R. Rif. C.; Mar. 26th.

Memoranda.—The undermentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: A. W. Edwards, late Lieut., S. Afr. Mtd. Rif.; April 2nd. Pte. W. A. Downie, from Lond. R. (T.F.); April 10th.

Supplementary to Regular Corps.—2nd Lieut. H. N. O'Donnell is placed on the ret. list on account of ill-health contracted on active service; May 2nd.

General List (R.F.C.).—Cadet W. T. Samuels to be Temp. 2nd Lieut. (on Prob.); Feb. 28th. (Substituted for Gazette notification of Mar. 26th, incorrectly describing surname as Samuel.) The undermentioned cadets to be Temp. 2nd Lieuts. (on prob.); Mar. 4th: W. B. Swart, E. J. Whyte.

London Gazette Supplement, May 2nd.
Flight Commander.—2nd Lieut. (Temp. Lieut.) C. Dunlop, Yeo. (T.F.), from a Flying Officer, and to be Temp. Capt. whilst so employed; April 13th.

Flying Officers.—April 4th: Temp. 2nd Lieut. J. F. Grose, Gen. List; Temp. 2nd Lieut. R. E. Jeffery, Gen. List; Temp. 2nd Lieut. B. J. Silly, Gen. List, and Lieut. A. M. Swynn, R. Ir. Regt., S.R., and to be sec'd.; April 5th. April 6th: Temp. Capt. R. D. Simpson, Gen. List, from a Flying Officer (Ob.), seniority May 20th, 1916; 2nd Lieut. S. W. Graham, S.R.; Temp. 2nd Lieut. H. J. Hinde, Gen. List; Temp. 2nd Lieut. H. F. Walker, Gen. List. April 7th: 2nd Lieut. (Temp. Lieut.) A. T. Rickards, R.A., from a Flying Officer (Ob.), seniority Jan. 18th, 1916; Temp. 2nd Lieut. E. H. Lascelles, K.R. Rif. C., and to be sec'd.; 2nd Lieut. K. R. Simpson, E. Lanc. R. (T.F.), and to be sec'd.; 2nd Lieut. (Temp. Capt.) A. B. Wright, High. L.I. (T.F.), and to be sec'd.; Temp. Lieut. T. Owen, S. Staff. R.; Temp. 2nd Lieut. R. Grant, Gen. List; April 8th. April 9th: Temp. 2nd Lieut. J. B. R. Langley, Gen. List, from a Flying Officer (Ob.), seniority June 2nd; Lieut. (Temp. Capt.) F. L. Barwell, Lond. R. (T.F.), and to be sec'd.; 2nd Lieut. (Temp. Lieut.) C. R. Robbins, M.C., R.A., from a Flying Officer (Ob.), seniority May 1st, 1916; 2nd Lieut. P. Warburton, R.G.A. (T.F.), and to be sec'd.; 2nd Lieut. F. E. Vipond, Manch. R. (T.F.), and to be sec'd.; 2nd Lieut. J. Boyd, Sco. Rif. (T.F.), and to be sec'd.; Temp. 2nd Lieut. T. J. Hudson, Gen. List; Temp. 2nd Lieut. R. C. Davies, attd. Notts. and Derby R., and to be transfd. to Gen. List. April 10th: 2nd Lieut. F. R. C. Davidson, Yeo. (T.F.), and to be sec'd.; Temp. 2nd Lieut. W. G. Cowie, Gen. List; 2nd Lieut. (on prob.) H. C. Patterson, Bedf. R., S.R., and to be sec'd. April 11th: 2nd Lieut. D. S. Buchanan, Ind. Army Res. of Off.; Temp. 2nd Lieut. D. M. Mackay, L'pool R.; Temp. 2nd Lieut. W. H. Peacock, Gen. List; Temp. 2nd Lieut. R. A. Preston, Gen. List, from a Flying Officer (Ob.), seniority May 3rd, 1916; Temp. 2nd Lieut. (on prob.) H. A. Payne, Gen. List; 2nd Lieut. (on prob.) C. E. Rushworth, S.R.; Temp. 2nd Lieut. (on prob.) J. Henry, Gen. List. April 12th: Temp. 2nd Lieut. L. Clarke, attd. Manch. R., and to be transfd. to Gen. List; 2nd Lieut. G. T. R. Pettigrew, Hereford R. (T.F.), and to be sec'd.; 2nd Lieut. (on prob.) E. F. Crossland, S.R.; 2nd Lieut. (on prob.) H. E. Biedermann, Yeo. (T.F.), and to be sec'd.; 2nd Lieut. A. C. Simpson, S.R.; Temp. 2nd Lieut. (on prob.) F. J. Foster, Gen. List. April 13th: Temp. Lieut. R. Erskine, Gen. List, from a Flying Officer (Ob.), seniority Dec. 28th, 1915; Lieut. W. M. D. S. Strettell, High. L.I., S.R., from Garr. Bn., R. Scots, and to remain sec'd.; Temp. 2nd Lieut. (on prob.) F. Thompson, Gen. List; 2nd Lieut. (Temp. Lieut.) J. F. Byrom, Lan. Fus. (T.F.), and to be sec'd.; Temp. 2nd Lieut. C. W. Cudmore, Shrops. L.I., and to be transfd. to Gen. List; Temp. 2nd Lieut. A. G. Cribb, Gen. List. Capt. W. H. Gilroy, Canadian Army Dental Corps; April 14th. April 15th: Temp. 2nd Lieut. (on prob.) J. Stevenson, Gen. List; Temp. 2nd Lieut. H. W. Piper, Gen. List.

Flying Officers (Observers).—Temp. Lieut. A. S. H. O'Brien, R.A., and to be transfd. to Gen. List; April 10th, seniority Dec. 16th. April 14th, seniority Dec. 26th: 2nd Lieut. A. J. Macnab, Arg. and Suthd. Highrs. S.R., and to be sec'd.; Temp. Lieut. F. C. B. Greene, Gen. List. 2nd Lieut. S. T. Wills, Northn. R., and to be sec'd.; April 13th, seniority Jan. 14th. Temp. 2nd Lieut. S. O. Hillman, Middx. R., and to be transfd. to Gen. List; Apr. 12th, seniority Feb. 16th.

Balloon Commander (graded as a Balloon Officer).—Temp. 2nd Lieut. T. Kenne, Gen. List, from a Balloon Officer; April 14th.

Equipment Officers, 1st Class.—2nd Lieut. (Temp. Lieut.) F. C. Rowe, S.R., from the 2nd Cl., and to be Temp. Capt. whilst so employed; April 9th.

2nd Class.—Lieut. E. Graham, S.R., from the 3rd Cl.; Mar. 20th. The appointment of Temp. Capt. R. F. Stapleton-Cotton, Gen. List, notified in the Gazette of Feb. 21st, is antedated to Nov. 11th.

3rd Class.—April 11th: 2nd Lieut. (Temp. Lieut.) G. J. K. Little, Yeo.

(T.F.), and to be sec'd.; Temp. 2nd Lieut. A. G. Mortlock, Gen. List, from a Flying Officer (Ob.); Temp. 2nd Lieut. A. D. S. Catling, Gen. List, from a Flying Officer. Temp. 2nd Lieuts., Gen. List—O. F. Clarke, G. Baker, G. N. Cockerell, C. A. Christmas, W. H. Dallow, N. A. C. Runnels-Moss, F. B. Stradling, A. J. Evans. 2nd Lieuts., S.R.—W. P. Farrow, B. S. Higgs, P. H. Paul, F. J. R. Peritt, W. Towell, S. Beeby, W. E. Dewbery, R. Hely, B. A. Hill, H. J. Lewis, A. McCulloch, D. H. Moore, H. J. Ashwell, G. Ashworth, W. Duff. B. B. Johnson, W. E. Lowe, C. Guthrie, J. F. Bargman, S. L. Collins, W. G. Cullen, A. H. Prior, H. J. Skingle, G. G. Wood.

Supplementary to Regular Corps.—The undermentioned 2nd Lieuts. (on prob. are confirmed in their rank: D. Warnford-Davis, A. C. Simpson. The undermentioned to be 2nd Lieuts. (on prob.): A. MacNamara; Mar. 17th. W. C. Chapman; April 11th. H. W. Pollock; April 16th. O. F. Cooke-Yarborough. April 17th.

London Gazette Supplement, May 3rd.
Wing Commander.—Maj. (Temp. Lieut.-Col.) C. Saunders, D.S.O., Dorset R., from Comdt., Staff Officer, 1st Cl. (graded as an A.A.G.), and to retain his temp. rank whilst so employed; April 23rd.

Flying Officers.—Temp. 2nd Lieut. F. H. Beer, Gen. List; Mar. 12th. Temp. 2nd Lieut. (on prob.) G. T. F. Hunter, Gen. List; Mar. 25th. Temp. 2nd Lieut. J. H. Cock, Gen. List; April 3rd. Temp. 2nd Lieut. R. W. Folliott, Gen. List, from a Flying Officer (Ob.); April 6th, seniority May 26th, 1916. April 7th: Maj. C. E. Sutcliffe, Canadian Inf. Bn.; Capt. N. S. Caudwell, Canadian Inf. Bn.; Lieut. A. S. Bourinot, Canadian Inf. Bn. 2nd Lieut. M. C. McGregor, S.R.; Temp. 2nd Lieut. (on prob.) D. J. Sheehan, Gen. List; Temp. 2nd Lieut. F. Libby, M.C., Gen. List, from a Flying Officer (Ob.), seniority Aug. 4th; 2nd Lieut. H. Kirby, S.R. April 9th: Temp. 2nd Lieut. H. B. Redler, Gen. List; 2nd Lieut. J. H. Blackall, Newfoundland R. Temp. 2nd Lieut. (on prob.) A. O. Bigg-Wither, Gen. List; April 11th.

Flying Officers (Observers).—2nd Lieut. (Temp. Lieut.) George Russell, R.F.A., (T.F.), and to be sec'd.; April 16th, seniority Jan. 15th. April 15th: Temp. 2nd Lieut. E. H. Jones, Gen. List, seniority Jan. 16th; Temp. 2nd Lieut. (on prob.) W. B. Giles, Som. L.I., seniority Jan. 24th, and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) H. F. N. Jones, Manch. R., seniority Feb. 13th, and to be transfd. to Gen. List; 2nd Lieut. J. Rothwell, Manch. R. (T.F.), seniority Feb. 15th, and to be sec'd.; Temp. 2nd Lieut. (on prob.) A. Jackson, Gen. List, seniority Mar. 9th; Lieut. J. L. Dickson, Canadian Gen. List, seniority Mar. 12th; Capt. J. A. Le Royer, Canadian Inf. Bn., seniority Mar. 25th.

Balloon Commanders.—The undermentioned to be graded as Balloon Officers: 2nd Lieut. (Temp. Lieut.) C. M. Down, Herts. R. (T.F.) Mar. 22nd. Mar. 30th: Temp. 2nd Lieut. (Temp. Lieut.) E. A. Cleaver, Gen. List; 2nd Lieut. (Temp. Lt.) J. Mitchell, S.R.

Balloon Officers.—Temp. 2nd Lieut. (on prob.) A. D. Riches, attd. Northd. Fus., and to be transfd. to Gen. List; Dec. 19th. Temp. 2nd Lieut. (on prob.) V. R. Wordingham, attd. Worc. R., and to be transfd. to Gen. List; Jan. 2nd, and Lieut. G. R. G. Topham, Lond. R. (T.F.); Jan. 16th. Temp. 2nd Lieut. D. J. W. Walker, Gen. List; Jan. 17th. Mar. 13th: 2nd Lieut. S. B. Kingston, W. Rid. A., and to be sec'd.; Temp. 2nd Lieut. (on prob.) H. B. Browne, attd. Essex R., and to be transfd. to Gen. List; 2nd Lieut. F. A. Shippam, S.R., from an Equipment Officer, 3rd Cl.; Temp. 2nd Lieut. S. Jolley, Gen. List, from an Equipment Officer, 3rd Cl. Mar. 27th: Lieut. E. A. Wickson, Can. Inf. Bn.; Temp. Lieut. J. E. Burgess, Gen. List; Temp. 2nd Lieut. (on prob.) A. E. Franklin, Gen. List; 2nd Lieut. C. E. Bagram, S.R., from an Equipment Officer, 3rd Cl.; Temp. 2nd Lieut. (on prob.) C. P. Vivian, Gen. List.

Equipment Officers, 3rd Class.—Temp. 2nd Lieuts., Gen. List: K. E. Beswick, L. D. Brown, J. Burden, B. W. H. Carter, A. E. Dyson, A. H. Stevens, B. C. Rayner, H. H. Harries, W. J. Maley, T. J. Owen, D. W. Sedgwick, C. J. Silverston, P. A. Wright; April 11th. Qmr. and Hon. Lieut. G. Watts (T.F.) Res.; April 15th.

Schools of Military Aeronautics.
Commandant, Staff Officer, 1st Class (Graded as an A.A.G.).—Maj. (Temp. Lieut.-Col.) B. R. W. Bear, R.A., a Wing Comdt., and to retain his temp. rank whilst so employed, vice Maj. (Temp. Lieut.-Col.) C. Saunders, D.S.O., Dorset R.; April 23rd.

Memoranda.—2nd Lieut. (Temp. Lieut.) F. G. Hogarth, R.F.C., S.R., to be Temp. Capt. while specially employed; May 4th. The undermentioned, from R.F.C., to be Temp. 2nd Lieuts. for duty with the Mil Wing of that Corps. April 11th: and Cl. Air-Mech. C. J. Silverston, Corp. J. Burden, 1st Cl. Air-Mech. H. H. Harries, 2nd Cl. Air-Mech. B. W. H. Carter, Corp. T. J. Owen, Qmr.-Sergt. K. E. Beswick, 1st Cl. Air-Mech. P. A. Wright. The undermentioned to be Temp. 2nd Lieuts. for duty with R.F.C. April 11th: Sergt. B. C. Rayner, from A.P.C.; Pte. A. E. Dyson, from A.S.C.; Lce.-Corp. L. D. Brown, from Yeo. (T.F.); Lce.-Corp. A. H. Stevens, from R.E.; Pte. D. W. Sedgwick, from O.T.C.; Mechanist Staff Sergt. W. J. Maley, from A.S.C. The undermentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: W. D. Buchanan; April 5th. W. H. Boston, late Temp. 2nd Lieut., Suff. R.; April 16th.

Supplementary to Regular Corps.—2nd Lieut. C. H. Vincent relinquishes his comm. on account of ill-health, and is granted the hon. rank of 2nd Lieut.; May 4th.

London Gazette, May 4th.

Temporary Appointments at the War Office.
Director.—Bt. Lieut.-Col. W. B. Caddell, R.A., from an Asst. Dir., and to be Temp. Brig.-Gen. whilst so employed, vice Bt. Lieut.-Col. D. S. MacInnes, C.M.G., D.S.O., R.E.; April 4th.

Assistant Directors.—From Dept. Asst. Dir., and to be Temp. Lieut.-Cols. whilst so employed. Mar. 21st: Temp. Maj. T. E. St. C. Daniell, M.C., Gen. List. 2nd Lieut. (Temp. Capt.) C. H. Whittington, R.F.C., S.R.

Deputy Assistant Directors.—Mar. 21st: Temp. Capt. H. M. Bentley, Gen. List, from an Equipment Officer, 1st Cl., R.F.C., vice 2nd Lieut. (Temp. Lieut.-Col.) C. H. Whittington, R.F.C., S.R. 2nd Lieut. F. B. Burton, R.F.C., S.R., from a Staff Lieut., and to be Temp. Capt. whilst so employed. Temp. Capt. R. H. Austin-Sparks, Gen. List, from a Dep. Asst. Dir. (graded for pay as a Staff Capt.). Temp. Lieut. (Temp. Capt.) H. A. P. Disney, Camb. R. (T.F.), from a Staff Capt. and to retain the temp. rank of Capt. whilst so employed, vice Temp. Maj. (Temp. Lieut.-Col.) T. E. St. C. Daniell, M.C., Gen. List.

D.A.A.G.—Maj. G. A. Travers, Res. of Off., from Staff Capt.; April 17th.
Staff Captains.—Mar. 21st: 2nd Lieut. (Temp. Capt.) P. C. A. Bridgeman, A.S.C. (T.F.), from an Equipment Officer, 2nd Cl., R.F.C., and to retain his temp. rank whilst so employed; Temp. Lieut. B. J. Wolfe-Barry, Gen. List, from a Staff Lieut., and to be Temp. Capt. whilst so employed; Temp. Lieut. W. A. W. Hallam, Gen. List, from a Staff Lieut., and to be Temp. Capt. whilst so employed; Temp. Capt. W. H. Ewen, Gen. List, from an Equipment Officer, 1st Cl., R.F.C., vice Temp. Lieut. (Temp. Capt.) H. A. P. Disney, Camb. R. (T.F.); Capt. R. W. Thomas, Lond. R. (T.F.), from an Equipment Officer, 2nd Cl., R.F.C.; Temp. Capt. H. E. A. Lindsay, Gen. List, from an Equipment Officer, 3rd Cl., R.F.C.; Capt. J. C. Wickham, D.S.O., R.E.; April 17th. 2nd Lieut. (Temp. Capt.) J. Dickson, S. Afr. Def. Forces, from an Equipment Officer, 1st Cl., R.F.C., and to retain his temp. rank whilst so employed; May 1st.

Staff Lieutenants.—Mar. 21st: 2nd Lieut. (Temp. Lieut.) A. L. Butcher, R.F.C., S.R., from an Equipment Officer, 2nd Cl., and to retain his temp. rank whilst so employed, vice 2nd Lieut. (Temp. Capt.) F. B. Burton, R.F.C., S.R.; and 2nd Lieut. (Temp. Lieut.) A. O. Betts, R.F.C., S.R., from an Equipment Officer, 2nd Cl., and to retain his temp. rank whilst so employed, vice Temp. Lieut. (Temp. Capt.) B. J. Wolfe-Barry, Gen. List; and 2nd Lieut. F. A. Corbett, R.F.C., S.R., from an Equipment Officer, 3rd Cl., vice Temp. Lieut. (Temp. Capt.) W. A. W. Hallam, Gen. List; Capt. J. W. G. Mackinlay, R.F.C., S.R., from an Equipment Officer, 2nd Cl., R.F.C.; Lieut. D. C. James, Worc. R., S.R., from an Equipment Officer, 2nd Cl., R.F.C.

Flying Officers.—April 16th: Temp. 2nd Lieut. (Temp. Lieut.) R. V. Kann, Gen. List, from a Flying Officer (Ob.), seniority May 1st, 1916; and 2nd Lieut. C. F. Briggs, R. W. Surr, R. (T.F.), and to be sec'd.; Temp. 2nd Lieut. V. F. S. Dunton, Gen. List. April 17th: 2nd Lieut. (on prob.) H. R. Hole, Lond. R. (T.F.), and to be sec'd.; Temp. 2nd Lieut. (on prob.) R. V. Williams, Gen. List; Temp. 2nd Lieut. (on prob.) C. E. Crowley, Gen. List.

Flying Officers (Observers).—Temp. Lieut. W. L. Hill, Gen. List; Oct. 21st, 1915. April 17th: 2nd Lieut. T. G. Fawcett, W. York. R. (T.F.), seniority Nov. 18th, and to be sec'd.; 2nd Lieut. H. R. Power, R. Ir. Rif., S.R., seniority Jan. 26th, and to be sec'd.; Temp. 2nd Lieut. (on prob.) G. B. Miller, High. L.I., seniority Jan. 31st; Lieut. V. R. Pfrimmer, Canadian Art., seniority Feb. 3rd; Temp. Lieut. G. Wilson, A.S.C., seniority Feb. 12th, and to be transf'd. to Gen. List; Temp. 2nd Lieut. P. A. de Escofet, Gen. List, seniority Mar. 9th.

Park Commander.—2nd Lieut. (Temp. Capt.) C. Jarrott, R.F.C., S.R., from an Equipment Officer, 1st Cl., and to be Temp. Maj. whilst so employed; Mar. 21st.

Equipment Officers, 3rd Class.—Temp. Lieut. O. M. D. Bell, Worc. R., and to be transf'd. to Gen. List; Nov. 22nd. Temp. Lieut. B. Humphrey, Suff. R.; Jan. 19th. Mar. 1st: Temp. 2nd Lieut. E. J. Leech, Conn. Rang., and to be transf'd. to Gen. List; 2nd Lieut. (on prob.) D. R. Pye, S.R.; Temp. 2nd Lieut. E. D. Leishman, Gen. List; April 1st. Temp. 2nd Lieut. (on prob.) W. A. Huntley, Gen. List; April 16th.

School of Aerial Gunnery.

Instructor (graded as an Equipment Officer, 1st Class).—2nd Lieut. (on prob.) (Temp. Lieut.) J. A. Cooper, Yeo. (T.F.), from an Asst. Instr. (graded as an Equipment Officer, 2nd Cl.), and to be Temp. Capt. whilst so employed; April 3rd.

Assistant Instructors (graded as Equipment Officers, 2nd Class).—Temp. 2nd Lieut. (Temp. Lieut.) A. T. Wynyard-Wright, Gen. List, a Flying Officer; Feb. 27th. Temp. 2nd Lieut. C. G. Riley, Gen. List, a Flying Officer (Ob.), and to be Temp. Lieut. whilst so employed, vice Temp. Capt. J. A. Cooper; April 3rd.

Memoranda.—Temp. 2nd Lieut. J. E. Burgess, Gen. List to be Temp. Lieut. for duty with R.F.C.; Mar. 27th. The undermentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: W. A. Lyon; Mar. 23rd. Lee-Corpl. H. V. Low, from O.T.C.; April 17th. Corpl. C. S. Crocker, from R.E. (T.F.); April 20th. May 4th: A. J. Bird, S. M. Barrett, A. W. Bishop, S. D. A. Jolly, S. G. Allen, A. B. Blayney, Pte. H. F. W. Farquharson, from Dorset R., S.R., B. Rotherham, J. G. Speirs, A. B. Starke, J. W. Gage.

Supplementary to Regular Corps.—The undermentioned 2nd Lieuts. to be Lieuts.; April 1st: (Temp. Capt. S. S. Nevill, C. R. Duggan, F. C. Buck, F. R. Hudson, A. E. McKay, F. L. Hambly, J. F. A. Day, G. C. Burnand, (since killed in action), F. Hitchens, E. Cooke, B. H. Hunt, J. A. Coats, S. E. Faber, T. W. Tattersall, F. S. Smith, (Temp. Capt.) J. Bell, (Temp. Capt.) C. J. Q. Brand, D. W. Hardy, W. L. Grech, L. V. Hirst, J. Seabrook (Temp. Lieut.) J. C. Forsyth, the Hon. M. Greville. The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank: E. F. Crossland, C. E. Rushworth, D. R. Pye, G. M. Erroll. The undermentioned to be 2nd Lieuts. (on prob.): W. T. Langton; Feb. 14th. G. N. J. Shaw; Feb. 20th. Feb. 26th: H. F. Farr, H. L. Shepherd, F. D. Williams; Mar. 2nd. E. O. Byam; Mar. 3rd. W. W. McDonald; Mar. 4th. J. G. F. F. Horridge; Mar. 5th. G. J. Blackmore; Mar. 13th. R. K. Armstrong; Mar. 14th. A. H. Comfort; April 18th.

London Gazette Supplement, May 5th.

Staff Officer, 3rd Class (graded for purposes of pay as a Staff Captain).—Capt. A. W. A. Harker, R.A., and to be sec'd.; Jan. 24th.

Flight Commander.—2nd Lieut. D. J. Bell, S.R., from a Flying Officer, and to be Temp. Capt. whilst so employed; April 9th.

Flying Officers.—Temp. 2nd Lieut. G. O. Smart, Gen. List (since killed in action); Feb. 21st. 2nd Lieut. (on prob.) R. C. Steele, S.R.; Mar. 20th. Mar. 21st: 2nd Lieut. (Temp. Lt.) W. S. Bean, R.E. (T.F.), and to be sec'd.; Temp. 2nd Lieut. (on prob.) J. B. Welman, R.A., and to be transf'd. to Gen. List. Capt. R. O. Skinner, R.A., and to be sec'd.; Mar. 22nd. Capt. M. L. Waine, Canadian A.S.C.; April 11th. April 13th: Capt. G. W. T. Lindsay, R.A., and to be sec'd.; 2nd Lieut. J. C. McNamara, Gen. List; 2nd Lieut. J. E. Williams, Yeo. (T.F.), and to be sec'd.; Temp. 2nd Lieut. F. G. M. Sparks, N. Staff, R., and to be transf'd. to Gen. List; Temp. 2nd Lieut. (on prob.) C. L. Beaumont, Gen. List; Temp. 2nd Lieut. (on prob.) W. J. Mussared, Gen. List. April 14th: 2nd Lieut. J. A. W. Binnie, High. L.I. (T.F.), and to be sec'd.; 2nd Lieut. H. Pater, W. York R., S.R. (since killed), and to be sec'd.; 2nd Lieut. T. Lethbridge, Middx. R. (T.F.), and to be sec'd. April 15th: 2nd Lieut. C. D. Grierson, Yeo. (T.F.), and to be sec'd.; Temp. Lt. H. K. Sykes, R. Fus., and to be transf'd. to Gen. List; 2nd Lieut. J. R. Tyrer, Manch. R. (T.F.), and to be sec'd., 2nd Lieut. (on prob.) R. Reeder, Manch. R. (T.F.), and to be sec'd.; Temp. Lieut. H. J. Duncan, M.C., Gen. List, from a Flying Officer (Ob.), seniority May 29th, 1916; Temp. 2nd Lieut. S. D. Withers, Bord. R., and to be

transf'd. to Gen. List; Temp. 2nd Lieut. C. Courtneidge, Gen. List, from a Flying Officer (Ob.), seniority Mar. 21st, 1916; 2nd Lieut. J. Bussey, Suff. R. (T.F.), and to be sec'd.; Temp. 2nd Lieut. A. C. Coley, Gen. List. April 16th: Temp. 2nd Lieut. (on prob.) E. W. Savours, Gen. List; 2nd Lieut. C. G. O. MacAndrew, Yeo. (T.F.), and to be sec'd.; 2nd Lieut. (on prob.) R. S. Phelan, S.R. April 17th: Temp. 2nd Lieut. N. E. S. Croager, attd. Norf. R., and to be transf'd. to Gen. List; 2nd Lieut. (on prob.) H. W. Wheatly, S.R.; Temp. 2nd Lieut. (on prob.) J. T. P. Jeyes, Gen. List. 2nd Lieut. J. A. Cairns, Arg. and Suthd. Highrs. (T.F.), and to be sec'd.; April 18th.

Flying Officers (Observers).—2nd Lieut. E. P. Hyde, Ches. R. (T.F.), from Mach. Gun Corps, and to remain sec'd.; Feb. 1st, seniority Sept. 28th. 2nd Lieut. F. V. Carpenter, Dorset R., S.R., and to be sec'd.; Mar. 15th, seniority Oct. 21st. Temp. Lieut. A. R. Rattray, Gen. List; Feb. 15th, seniority Nov. 7th. 2nd Lieut. (Temp. Lieut.) A. E. A. Dunston, Dorset R. (T.F.), and to be sec'd.; Mar. 1st, seniority Nov. 30th. Temp. Capt. W. H. L. O'Neill, Ind. Army; Mar. 28th, seniority Feb. 4th. April 18th: 2nd Lieut. (on prob.) F. P. Bruce-Austin, R.F.A., S.R., with seniority from Feb. 16th. 2nd Lieut. A. T. S. L. de Lacroix, Yeo. (T.F.), with seniority from Mar. 5th and to be sec'd.

Balloon Company Commander (graded as a Flight Commander).—2nd Lieut. (Temp. Lieut.) J. R. Bedwell, R.G.A. (T.F.), from a Balloon Comdr. (graded as a Balloon Officer), and to be Temp. Capt. whilst so employed; April 15th.

London Gazette Supplement, May 7th.

The undermentioned to be 2nd Lieut. for service in the Field:—
For Duty with R.F.C.—Actg. Sergt.-Maj. T. Bell, from R.F.C.; April 3rd.
The undermentioned to be Temp. 2nd Lieuts.:—

For Duty with R.F.C.—Feb. 18th: Squad. Qmr.-Sergt. A. D. Makins, from Yeo. (T.F.); Sergt. F. Hyde, from Yeo. (T.F.); Corpl. R. A. Stedman, from N.Z.E.F.; Pte. J. A. Douglas, from A.S.C.; Sapper T. W. White, from N.Z.E.F. Feb. 21st: Qmr.-Sergt. F. J. Horrell, from N.Z.E.F.; Sergt. R. R. W. Millward, from A.S.C.; Sergt. A. H. Bird, from Yeo. (T.F.); Trooper A. C. McArthur, from N.Z.E.F.

Temporary Appointments at the War Office.

Assistant Director.—Maj. J. G. Weir, R.F.A. (T.F.), from a Dep. Asst. Dir. (graded for pay as a Staff Capt.), and to be Temp. Lieut.-Col. whilst so employed; Mar. 21st.

Deputy Assistant Director (graded for pay as a Staff Captain).—2nd Lieut. (Temp. Capt.) M. O. Darby, R.F.C., S.R., from a Staff Capt., and to retain his temp. rank whilst so employed; Mar. 21st.

Staff Captain.—Temp. Capt. H. J. Page, Lond. R. (T.F.), from a Staff Lieut., and to be sec'd., vice 2nd Lieut. (Temp. Capt.) M. O. Darby, R.F.C., S.R.; Mar. 21st.

Staff Lieutenants.—Capt. P. A. Denny, Arg. and Suthd. Highrs., and to be sec'd., vice Temp. Capt. H. J. Page, Lond. R. (T.F.); Mar. 21st. Temp. 2nd Lieut. H. M. Paul, Gen. List; April 19th.

Flight Commander.—2nd Lieut. (Temp. Lieut.) R. W. P. Hall, R.F.A. (T.F.), from a Flying Officer, and to be Temp. Capt. whilst so employed; April 20th.

Flying Officers.—2nd Lieut. J. R. Milne, Ches. R. (T.F.), and to be sec'd.; Mar. 24th. 2nd Lieut. M. C. Crcrar, R.A., and to be sec'd.; Mar. 27th.

Flying Officers (Observers).—Lieut. P. E. Welchman, K.O. Sco. Bord., and to remain sec'd.; Nov. 15th, seniority from Sept. 6th. (Substituted for the notification in the Gazette of Mar. 9th). Temp. Lieut. B. J. A. Claudet, Gen. List; Mar. 23rd, seniority Oct. 31st.

Balloon Officers.—The undermentioned, whose appointments were notified in the Gazette of Mar. 27th, to take seniority from the dates stated: Lieut. T. G. Thornton, York R. (T.F.); July 10th. 2nd Lieut. (Temp. Lieut.) A. G. Church, R.G.A., S.R.; Sept. 3rd.

Park Commander.—Capt. W. E. G. Statler, R. Lanc. R., from an Equipment Officer, 1st Cl., and to be Temp. Maj. whilst so employed; April 19th.

Equipment Officers, 1st Class (and to be Temp. Captains whilst so employed).—Temp. Hon. Lieut. A. R. Howard, Gen. List; Mar. 17th. April 19th: Temp. Lieut. L. Y. K. Murray, Gen. List, from a Flying Officer; 2nd Lieut. (Temp. Lieut.) J. McCrae, Sea. Highrs., from an Equipment Officer, 2nd Cl.

2nd Class.—Temp. Hon. Lieut. J. H. Smith, Gen. List; Mar. 17th. 2nd Lieut. (on prob.) J. H. Valentine, S.R.; April 19th. 2nd Lieut. (Temp.) Lieut. J. McCrae, Sea. Highrs., from an Asst. Instr. (graded as an Equipment Officer, 2nd Cl.), and to retain his temp. rank whilst so employed; Mar. 27th. (Substituted for the notification in the Gazette of April 11th).

3rd Class.—Temp. Lieut. R. F. Wills, Gen. List, from a Flying Officer (Ob.); Sept. 1st.

Memoranda.—Sub-Lieut. J. A. Claudet, from R.N.V.R., to be Temp. Lieut. for duty with R.F.C.; Mar. 23rd, seniority Oct. 31st. The undermentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C. May 4th: A. W. Hamlin, J. Smallbone.

Supplementary to Regular Corps.—The undermentioned to be 2nd Lieuts. (on prob.); April 10th. With seniority from Feb. 7th: A. N. Baker, G. H. Noyes. With seniority from Mar. 14th: W. G. Stuart, W. R. Irwin, R. H. Little, W. A. Campbell, W. N. Clements, C. H. Lick, J. A. Cote, S. P. Waddell, D. S. Thompson, L. S. Brander, L. W. Boland, C. A. Bissonett.

Aeronautical Inspection Department.

London Gazette, May 1st.

The undermentioned Temp. Hon. Lieuts., Gen. List, to be Temp. Hon. Capts. (without the pay or allowances of that rank) whilst employed as Inspns., Aeronautical Inspn. Dept. April 1st: A. Boor, T. Greening, H. E. Fozard, G. T. Smith-Clarke.

"Undisputed Run of the Sky."

M. ANDRÉ TUDÉSO, special correspondent of the *Journal* at the British Front, writing on the 4th, says:—

"Eighteen bombardment and observation squadrons of British aviators, each protected by a couple of scouting machines, have the undisputed run of the sky."

From the German Point of View.

PAPERS recently obtained from German prisoners testify to the effective work of the British air service at the Front.

From an observation officer's report:—

"About 7 a.m. the first aeroplane observers arrived. From this time the fire increased to such a degree that for many hours of the day it might be described as regular drumfire. . . . The fire was so well directed that the whole of the front trench and K2 behind D4 (including communications) are pretty well blown to pieces."

From the notebook of an officer of a Reserve infantry regiment:—

"Enemy's aerial activity extraordinary and fearless. Own

observation planes are chased away at once by enemy fighting planes. Hardly any fighting planes of ours."

A Fight Over Dunkirk.

ON May 2nd, at midday, writes the *Times* correspondent in Paris, a duel took place above the commune of Rosendaelby-Dunkirk between a British and a German aeroplane, in which the former was victorious. Both the German airmen were killed, the observer being shot out, with one of the wings of the machine, 500 yards away from the body of the machine, which fell 200 yards outside the town gates.

Success by Greek Pilots.

ON the night of March 31st two Greek aviators attached to a British aerodrome in the Aegean made a raid on the district of Drama and dropped many bombs from a height of five or six hundred feet on the aerodrome and railway station.

An Apology by France.

FRANCE has expressed its regret for the recent inadvertent bomb-dropping at Porrentruy in Switzerland, and will pay all damages.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters, May 1st.

"Marked activity in the air continued yesterday and during the night. In air fighting eight German machines were brought down by our aeroplanes, two of which fell in our lines, and nine others were driven down out of control. Another hostile machine was shot down by gunfire. Nine of our aeroplanes are missing."

General Headquarters, May 2nd.

"Many fights took place in the air again yesterday, and 10 German aeroplanes were brought down, one of which fell in our lines. Six other hostile machines were driven down out of control by our aeroplanes, and a seventh was shot down in our lines by gun fire. Four of our machines are missing."

War Office, May 2nd.

"Salonica.—On our Doiran front an enemy aeroplane was shot down in flames, and fell in our lines."

General Headquarters, May 3rd.

"Great activity in the air continues. Four German aeroplanes were brought down yesterday in air fighting, and another hostile machine was shot down in our lines. In addition, our aeroplanes drove down five other enemy machines out of control and destroyed four German kite balloons. One of our machines is missing."

General Headquarters, May 4th.

"A number of successful bombing raids were carried out by our aeroplanes yesterday, resulting in severe fighting in the air. Three hostile machines were brought down by our aeroplanes, and five others were driven down out of control. Two other German machines were shot down by fire from the ground, and another was compelled to land behind our lines. Two of our aeroplanes are missing."

General Headquarters, May 5th.

"Yesterday fighting in the air again resulted in our favour. Five German machines were brought down by our aeroplanes and four others were driven down out of control. In addition one enemy machine was shot down by our anti-aircraft guns. Two of our aeroplanes are missing."

General Headquarters, May 6th.

"An encounter took place in the air yesterday between six British aeroplanes and from 15 to 20 German machines attacking in different parties. The enemy succeeded in breaking up our formation, but our machines continued to support each other, and brought down one German aeroplane just inside our lines. Two other enemy machines were brought down and seen to crash behind the enemy's lines. In addition, two more enemy machines were driven down out of control; the remainder of the enemy broke off the engagement. All six of our aeroplanes returned safely, though much shot about. In all, four German machines were brought down by our aeroplanes yesterday, and five others were driven down out of control. Another two enemy machines were shot down by our anti-aircraft guns. Two of our machines are missing."

General Headquarters, May 7th.

"Successful work was done by our aeroplanes yesterday in spite of a strong wind. Six German aeroplanes were brought down, one of which fell within our lines. One other enemy machine was driven down out of control. Three of our machines are missing."

French.

Paris, April 30th.

"During the night enemy aeroplanes dropped several bombs in the regions of Dunkirk, Nancy and Belfort. There were no victims, and the damage done was insignificant. Chaions and Epervay were also bombarded. There were no victims among the civil population. On Saturday night our bombarding aeroplanes carried out several operations. A captive balloon on the ground and the sheds of its crew were bombarded. A fire was seen to break out and explosions were heard. In addition the railway stations of Pont Faverger and Bétheniville and the bivouacs near Epoye received numerous projectiles."

Paris, May 2nd.

"On the night of April 30th our bombarding squadrons dropped many bombs on several railway stations and military establishments in the region of Laon, Vouzier, and Rethel. Fires were seen to break out."

Paris, May 3rd.

"On May 2nd our chasing aeroplanes were particularly active. During numerous air fights fought by our pilots four German machines were brought down, and 15 others

were seen to fall in their lines damaged. In the night of April 29th-30th one of our air squadrons bombarded the station and factories of Thionville. During the morning of May 1st our aeroplanes dropped 320 kilogrammes (700 lbs.) of projectiles on the aviation camp of Sissonnes. The following night the same camp received 2,000 kilogrammes (nearly 2 tons) of explosives. A great conflagration was observed in the sheds. During the night of May 1st-2nd one of our groups bombarded the stations of Bétheniville, Pont Faverger, and Chatelet-sur-Retourne, where a very furious conflagration, accompanied by several explosions, broke out."

Paris, May 4th.

"Yesterday our pilots brought down five German machines, and it is confirmed that three of the enemy machines which were reported as having been seriously damaged during the fighting on May 2nd were really brought to the ground. A German machine, towards 10 p.m. yesterday, dropped several bombs in the region of Dunkirk. There were no victims and no damage was done."

Paris, May 5th.

"Salonica.—The enemy depôt at Cestovo was bombarded by British aircraft."

Paris, May 6th.

"On Thursday night, and on the night following, our bombarding squadrons dropped 8,500 kilos. (about 8½ tons) of explosive on military establishments, railway stations, and bivouacs belonging to the enemy, notably on the factories of Hagondange. Several fires were seen to break out at the points bombarded. During the day on Friday our pilots brought down three German aeroplanes. A fourth enemy machine was brought down by the fire of our anti-aircraft guns."

Belgian.

Havre, May 4th.

"Allied airmen bombarded the German aviation centre of Ghisteltes. During the night of May 3rd-4th the Belgians, for their part, dropped 1,500 kilogrammes of projectiles."

Russian.

Petrograd, May 2nd.

"A squadron of enemy aeroplanes conducted a flight over Tecuciu, and threw about twenty bombs on the town."

Petrograd, May 3rd.

"Black Sea.—One of our hydroplane squadrons threw 120 bombs on Mahmudia (on the Danube). Great destruction was observed. Notwithstanding the intense shrapnel fire of the enemy all the machines and airmen returned unharmed."

"We brought down a German aeroplane, which fell in the neighbourhood of Horozanka (Eastern Galicia). The machine and the airmen were captured."

Petrograd, May 4th.

"East of Takkum a German aeroplane was brought down by rifle fire. It fell within the enemy lines, catching fire during its descent. Also in the region of Zaturzy a German aeroplane was brought down by our artillery fire. It fell between our entanglements and those of the enemy."

Petrograd, May 5th.

"Our airmen made a raid on Vilna, and dropped bombs on the railway station. Enemy aeroplanes dropped bombs on Stanislavoff."

Italian.

Rome, April 26th.

"Aeroplanes bombarded the railway works of Reichenberg with good results, and all returned safely to our lines. During the night one of our airships dropped 600 kilos. of high explosives on the stores and sheds in the neighbourhood of Nabresina. The airship was discovered during its return by a squadron of enemy aeroplanes, but ascended rapidly into the clouds, thus avoiding attack, and returned safely into our lines."

Rome, April 27th.

"Hostile aircraft continued active yesterday on the Trentino front, and as far as the Upper Valleys of the Carnia. Our machines attacked them vigorously and made reconnaissance flights as far as Brixen and Franzensfeste."

"Enemy seaplanes dropped bombs on San Canziano without doing damage or causing casualties. During an air fight an enemy machine was brought down; it fell in the neighbourhood of San Martino on the Carso. One of the aviators was killed and the other wounded and taken prisoner."

Rome, April 28th.

"In the course of yesterday there was persistent artillery and aerial activity on the Trentino and Carnia fronts."

Rome, April 29th.

"On the 28th, from Lake Garda as far as the Brenta, there was continuous activity by enemy aviators, who dropped bombs on Ala (Val Lagarina) and on Fiera di Primero (Cismon-Brenta Valley) without, however, causing any damage."

Rome, April 30th.

"During the night enemy aeroplanes dropped bombs on hamlets on the Lower Isonzo, causing slight damage. In reply, two of our seaplanes at once started out and bombed the enemy aeroplane base near Trieste. Both seaplanes returned safely."

Rome, May 1st.

"Enemy seaplane raids are reported on the Lower Isonzo. Some damage was done."

Rome, May 2nd.

"There was considerable aerial activity on both sides. Last night two of our aeroplanes bombed the railway station of Opcina, and then returned safely to their base."

Rome, May 3rd.

"Last night enemy airmen dropped bombs upon training establishments and dwellings at Codigoro [in the marshes at the mouth of the Po]. Some damage was done to buildings, but there was no loss of human life. One of our aerial squadrons renewed its bombardment of military works at Opcina and Prosecco (both north of Trieste), afterwards returning in safety to its base."

German.

Berlin, April 28th.

"Three enemy aeroplanes were brought down by our anti-aircraft guns, and two captive balloons were shot down in aerial engagements."

"German seaplanes on Thursday last successfully dropped bombs on the port installations of Sulina (at one of the mouths of the Danube in Roumania). Big fires were seen to break out in the harbour district and on some lighters. All our seaplanes returned safely, despite violent enemy anti-aircraft fire."

"*Eastern Front.*—After an air battle a Russian aviator fell behind our lines."

Berlin, April 30th.

"On the 28th instant, on the Western front, the enemy lost 11 aeroplanes, and on the 29th 23 aeroplanes, in addition to three captive balloons. Our airmen and anti-aircraft guns shared in this result. Baron von Richthofen achieved his

forty-eighth, forty-ninth, fiftieth, fifty-first and fifty-second serial victory, and Lieutenant Wolff, belonging to his chaser echelon, shot down five enemy machines, thus securing his twenty-sixth victim. Reconnoitring raids and flights for the purpose of dropping bombs took our airmen deep into the area of France occupied by the English between the Somme and the sea, and before the Aisne front beyond the Marne, in a southerly direction."

Berlin, May 1st.

"Yesterday 22 enemy aeroplanes were shot down in aerial fighting and three by fire from anti-aircraft guns. Three of our one-seater battleplanes attacked a group of five French captive balloons north-west of Rheims, and brought them all down in a burning condition."

Berlin, May 2nd.

"The enemy yesterday lost 14 aeroplanes in aerial engagements. Lieut. Wolff shot down his twenty-eighth and twenty-ninth opponent, and Lieut. Schaeser his twenty-fourth and twenty-fifth."

Berlin, May 3rd.

"Aerial activity over and behind the positions, both by day and night, was very lively. The enemy's losses in aerial engagements consist of one captive balloon and eight aeroplanes. One of the aeroplanes was lost by a forced landing, seven by anti-aircraft gunfire from the ground."

Berlin, May 4th.

"With the favourable weather on the Western Front there is lively aerial activity. Battery positions, railway establishments, camps and munition depôts near Arras and to the south of the Aisne have been successfully bombarded by our airmen. The enemy lost 10 aeroplanes."

Berlin, May 5th.

"The enemy yesterday lost seven aeroplanes and one captive balloon. By an aerial attack on Ostend a large number of Belgians were killed and wounded. No military damage was done."

Bulgarian.

Sofia, April 30th.

"A Russian aeroplane dropped bombs on Tulcea, injuring several civilians."

Turkish.

Constantinople, April 30th.

"*Irak Front.*—On April 28th Captain Schutz brought down in an air fight his eighth enemy aeroplane—a British machine, "from Liverpool"—which fell behind our lines. The pilot, who was wounded, was taken prisoner."

SIDE-WINDS.

ANYTHING which leads to economy should be welcome in these times, and on that account alone a bright future is assured for a little speciality which is being introduced by Messrs. F. Sage and Co., Ltd., Peterborough. It is a rubber shock-absorber ring, the use of which, when its advantages are realised both by designers and manufacturers, should become almost universal. In the Sage-Feary shock-absorber rings, as they are called, the rubber is practically endless, and both in the rubber and the braiding there is no ugly and unmechanical joint which may give way at any moment. Not only does the use of these rings eliminate the waste of ends, which represents a good deal of money in a large machine, but the ease with which they can be fitted will save 50 per cent. in labour and 75 per cent. in time. The rings can be made to suit any type of shock absorber, and their use is approved by the Admiralty; they are made to comply with the requirements of the A.I.D. An advantage from the user's point of view is that if the shock absorber is damaged it is only necessary to replace the damaged rings, whereas in the old system the whole length of rubber would have to be scrapped. Due to the special way in which they are made, the tension is uniform throughout all the rubber strands, and so it is possible to get a much better curve than can be obtained with straight rubber cord.

A.G.S., Ltd., a firm known to some, but probably not known to all—Aeroplane General Sundries, Ltd., of 69-70, Fulwood House, Fulwood Court (adjoining Chancery Lane Tube Station), Holborn, W.C.1—are issuing, like some other suppliers, a fortnightly journal or stock list, and which includes a novel competition for those engaged in the aircraft industry. The consideration of this competition is calculated to and should certainly be of great interest to everyone, being, as it is, connected with the question of A.G.S. standard parts for aircraft. The first prize is £5, and there are two other prizes of £1 and 10s. each respectively. Entry forms are issued with the A.G.S. stock list, which is posted gratis. The entry fee, to cover expenses, &c., is 6d. for each attempt. Aeroplane General Sundries, Ltd., have set themselves out to supply ex-stock only, and already

have done considerable business, which has proved their utility to the industry generally.

OWING to the demands of Government Departments, the Triplex Safety Glass Co. are unable, at present, to execute the numerous orders they have received from private individuals and firms. These, however, will be dealt with in strict rotation as opportunity offers.

THE first issue of the Whiteman and Moss stock list is out, and a very practical idea it is. It is quite simple, and clearly sets forth the quantities which can be obtained of each fitting and the price. The first list covers A.G.S. bolts, wire ferrules, nuts, brass heart thimbles, washers, tie-rods, pins, high-tension wire, as well as some specialities for Short machines in the way of copper ferrules, mild steel U bolts, strainers, &c. The venture is one which is greatly to be commended, and will doubtless be appreciated by the many clients of the firm. Those who have not had their names put on Messrs. Whiteman and Moss's mailing list to receive a copy of their fortnightly circular should send along at once to their headquarters at 15, Bateman Street, W. 1, to see that it is done.

Most of the engineering works in Luton have organised fire brigades, and an exciting competition was held on April 28th. In the one-man drill the Skefko and Vauxhall representatives tied with 24½ sec., and in the run-off the former (Jackson) did 3 sec. better and won. In the two-men drill Skefko was first, Kent's second and Vauxhall third, while with three men the order was: 1, Commer Cars; 2, Skefko; 3, Vauxhall. The four-men event fell to Kent's, with Skefko second. Gold medals were awarded to the winners, and a £30 challenge cup, to be held as a championship trophy for one year, was carried off by Skefko (Chief Officer, H. J. Evans) with an aggregate of 34 points; Vauxhall Motors being second with 20 points. The judges declared that the performances were remarkably clever, and were bound to increase the efficiency of the brigades. A committee

composed of Messrs. A. J. Hancock (Vauxhall), J. Eaton Smith (G. Kent, Ltd.), and Hafner (Skefko) made all the arrangements for the competition, which it is intended to make an annual one.

FOR family reasons, the firm of John Remer and Co., the well-known timber merchants, of 14, Dale Street, Liverpool, has been converted into a private limited company, under the style of John Remer and Co., Ltd., of which Mr. John R. Remer is the Governing Director. All the capital in the business standing to the credit of the late senior partner has been retained by the issue to his executors of 6 per cent. preference shares. A unique and very commendable point about the new company is that the memorandum and articles of association have been so worded that no issue of debentures will or can be made.

SAMPLES of L'Etoile petrol resisting tubing in its new form, complying with the requirements of the A.I.D., are to hand, and appear to be a great improvement on the earlier kind, good as this was, of which the firm of Mestre and Blatge, of Store Street, Tottenham Court Road, have sold many thousands of yards. In the new tubing, in addition to its being treated in order to be petrol resisting, there are two layers of prepared canvas, each surrounded and separated from its fellow by further prepared rubber, the whole forming an ideal tubing for the purpose required. It is marketed in three sizes, $\frac{1}{4}$, $\frac{5}{16}$, and $\frac{3}{8}$ in., small samples of which may be obtained on application to the firm.

CELLON PROGRESS.

"I USED to work hard all day going round getting orders for my dope, attending to correspondence and accounts, and running the business generally, and then stay up most of the night making dope."

Thus Mr. Wallace Barr the other day when chatting over the extraordinary growth of the "Cellon" dope business. The period referred to was 1911, not so very long ago as the years roll, but quite a lengthy time in the world of aviation. In 1911, then, Mr. Barr, under circumstances that do not matter, found himself sole proprietor, manufacturer, manager, salesman, and office staff all rolled into one. No wonder that he had to work during most of the 24 hours that go to make a day, and no wonder that, having worked thus, his preparation is to-day receiving and maintaining a world-wide reputation, and Mr. Barr himself a satisfactory return for his early labours and faith in the article so closely associated with his name. 1912 was the year in which the one-man business had developed into something resembling a concern, a small works being acquired at Battersea where the dope could be manufactured in something like reasonable quantities with a view to filling the demands made for it.

Wherever flying was in progress there was to be found Wallace Barr, tall and energetic, generally without a hat, always moving about amongst the machines, always talking

"Cellon," always selling it. With such energy behind it, it was little wonder that the business soon became unmanageable by one man, necessitating the formation of Cellon, Ltd. This not only brought into line the factory at Stratford where "Cellon" has been manufactured for some time past, but it also brought to the benefit of the company the wonderful chemical knowledge of Mr. Thomas Tyrer, F.I.C., F.C.S., who has done so much in so many ways for the betterment of that which was already so good. Especially has this been the case when, owing to the outbreak of the war, and for other reasons, materials of certain kinds became difficult to obtain, and in some cases impossible, substitutes having to be found, occasionally to the material advantage of the finished article.

With the war came increasing and ever increasing orders, so that even the factory at Stratford has been unable to cope with them, and larger premises have, as we noted recently, been taken at Richmond. These will probably be complete with all the necessary machinery in the near future, when it will be possible to manufacture the dope in the wholesale quantities which the activity in aeroplane construction demands. It is unfortunately impossible, for obvious reasons, to give any definite information with regard to output and such matters, but a visit to the company's offices, which will continue at Broad Street House, New Broad Street, will disclose Mr. Barr genial as usual, whilst a look round his museum of aviatic curios cannot help but prove both entertaining and instructive.

PUBLICATIONS RECEIVED.

Model Aeroplane Making for Beginners. London: Percival Marshall and Co. Price 6d. net; post free, 7d.

The City of Nottingham: Past, Present, and Future. Nottingham: The Corporation of Nottingham, Guildhall.

The Elementary Principles of Wireless Telegraphy. By R. D. Bangay. Part II. London: The Wireless Press, Ltd., Marconi House, Strand. Price 2s.

NEW COMPANY REGISTERED.

DOWNS PATENTS, LTD.—Capital £150 in £1 shares. Objects: To assist T. M. Down in perfecting his inventions for aircraft improvements and metal alloys, and in exploiting and patenting the same, &c.

Aeronautical Patents Published.

Applied for in 1916.

The numbers in brackets are those under which the specifications will be printed and abridged, &c.

Published May 3rd, 1917.

- 6,384. J. R. HUCK. Air-ship. (105,274.)
- 7,958. C. D. WOODWARD. Apparatus for indicating direction of travel of aeroplane, &c., by the sun. (105,280.)
- Published May 10th, 1917.
- 2,935. H. B. WATSON AND T. C. BILLETOP. Radiators for aircrafts, &c. (105,351.)
- 4,950. C. R. WATERS. Anti-aircraft guns. (105,364.)

Index and Title Page for Vol. VIII.

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